

# A REVISION OF THE LIZARDS OF THE GENUS CTENOSAURA

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## INTRODUCTION

A few years ago Dr. Thomas Barbour, of the Museum of Comparative Zoölogy, in reporting on "Some Reptiles From Old Providence Island"<sup>1</sup> made the following statement concerning the genus *Ctenosaura*:

A single young *Ctenosaura* was obtained, which certainly is closely related to *C. completa* Bocourt. It is, however, not improbably distinct and undescribed. The genus *Ctenosaura*, however, is in quite a chaotic condition, but it can not be revised to meet the modern requirements of the discriminating systematist until the types of the early authors can be examined; and in this case the types are widely scattered in various European museums.

Later Doctor Barbour took up the question of this genus with Dr. L. Stejneger, curator of the division of herpetology at the United States National Museum, receiving in response to his inquiries the following letter:

Some time ago you asked my opinion as to *Ctenosaura cycluroides* and others, but frankly I am as much in a quandary as you. Many years ago I tried to get light on the question, but gave up in despair, waiting till I should get more material. In the course of time quite a number of specimens have accumulated, of the group Boulenger calls *C. acanthura*, certainly over 150—many very large specimens, and of these many not too well preserved. However, I have not had the courage to tackle them again. I had come to a tentative conclusion at the time, based chiefly on the characters of the verticils of the tail, which seem more reliable than those of the spines on the vertebral line, but I could not make up my mind which was the real *C. acanthura*, which I think can only be ascertained from an examination of the type in London.

Shortly after the receipt of the above letter by Doctor Barbour the writer matriculated in the graduate school at Harvard University, and immediately fell heir to the "*Ctenosaura* problem," a task that has been difficult and at times discouraging, yet very pleasant because of the friendly interest manifested by coworkers in this country and in Europe.

<sup>1</sup>Barbour, T. Proc. New Engl. Zool. Club, vol. 7, pp. 81-85, May 6, 1921.

This paper is based upon the collections in the British Museum of Natural History, London; des Naturhistorischen Museums, Hamburg; Zoölogisches Museum, Berlin; Museum d'Histoire Naturelle de Paris; California Academy of Science, San Francisco; American Museum of Natural History, New York City; United States National Museum, Washington, D. C.; and the Museum of Comparative Zoölogy, Cambridge, Mass., altogether a large and representative series indeed.

Two new species are described, one, *Ctenosaura parkeri*, from Barranca Ibera, Jalisco, Mexico, is dedicated to H. W. Parker, herpetologist, British Museum of Natural History, through whose kindness the writer was enabled to examine the important types in England. Two visits to the United States National Museum in Washington made it possible to study the types there. The second new species, *clarki*, is dedicated to Dr. Herbert C. Clark, director of medical research and laboratories, United Fruit Co., through whose interest and efforts the various collections at the Museum of Comparative Zoölogy have been augmented from time to time. With the exception of *Cyclura (Ctenosaura) teres*, which was described from a living specimen, by Harlan in 1824, and of which there is no record of its ever having been preserved, and *Iguana (Ctenosaura) similis*, Gray, which was at one time in the Bell Museum, London, but subsequently disappeared, the type specimens of every form referred to the genus have been carefully studied.

To the following persons the writer wishes to offer his sincere thanks for valuable aid in the preparation of this revision: Mr. H. W. Parker, London; Dr. George Dunker, Hamburg; Dr. Ernest Ahl, Berlin; Dr. F. Angel, Paris; Dr. L. Stejneger and Miss Doris M. Cochran, Washington; Mr. J. R. Slevin, San Francisco; and Dr. Thomas Barbour, Cambridge, Mass.

#### ABBREVIATIONS

M. C. Z	-----	Museum of Comparative Zoölogy, Cambridge, Mass.
A. M. N. H	-----	American Museum of Natural History, New York, N. Y.
U. S. N. M.	-----	United States National Museum, Washington, D. C.
Brit. Mus.	-----	British Museum of Natural History, London, England.
C. A. S.	-----	California Academy of Science, San Francisco, Calif.
M	-----	Male.
F	-----	Female.
A	-----	Adult.
Y	-----	Young.
H-grown	-----	Half grown.

#### GENERAL CONSIDERATIONS

The genus *Ctenosaura* includes 13 species of lizards, the distribution of which is confined to Mexico and Central America. In the West Indian region their place is taken by the genus *Cyclura*, to

which some of the earlier described species of *Ctenosaura* were assigned. The two genera are very closely related, but may be readily distinguished from each other by a comparison of the soles of the hind feet; in *Cyclura* there are peculiar corneous combs or pectinations on the under side of the toes; the toes of *Ctenosaura* are without such corneous combs.

The species are powerful and very active, and can make a good defense when necessary by the use of their small sharp teeth, and of their spinose tail. This organ is armed with whorls of spinous scales which are very acute and which inflict considerable wounds when driven against the naked surface of the skin. Ctenosaurs are not much valued as food by the natives of Mexico and Central America, except by some Indians, and like other large tree and rock lizards are called iguanas.

We know very little if anything of the geologic history of this genus, and one simply gropes in the dark in attempting to treat of this phase of the subject. However, a few facts relative to the family Iguanidae, to which this genus belongs, will be given merely to throw some light on the possible origin and distribution of the group. All of the Iguanidae are confined to North and South America with the exception of one genus (*Brachylophus*) which inhabits the Fiji Islands and two others (*Chalarodon* and *Hoplurus*) living in Madagascar. A fossil species of iguana (*Iguana europaea*) has been described from the Eocene deposits of France and England. The Cretaceous genera *Iguanavus* and *Chamops* from Wyoming have always been considered as belonging to the Iguanidae, so there is no reason to doubt that the family has originated in America and that it was present during the latter part of the Mesozoic era.

Although no very satisfactory conclusions, perhaps, can be reached regarding the main question of the origin of the species of *Ctenosaura*, the data derived from this study indicate very strongly the close relationship to, and their origin from, a common iguanid stock. Also from the present distribution of the species it seems but logical to believe that they originated at some place in central western Mexico, probably Nayarit and Jalisco, and that they have spread thence northward and southward until they cover practically the whole of Mexico and Central America. The transition in morphological characters has been gradual, and there is no obvious break in the series, indicating, of course, land migration only.

By a strange coincidence the type, *Ctenosaura acanthura*, is both the most primitive and the most widely distributed species of the genus, and evidently had, at an early date, firmly established itself throughout Mexico, being numerous on both the east and west coasts. Even to-day this species has practically the same distribution.

The presence of several species within a short radius makes it impossible to determine the origin of the various species. The order of arrangement of the species in this paper has been made with regard to structural relationship and not according to geographical distribution or to any supposed origin.

During the lower and upper Cretaceous, the upper Eocene and the early Oligocene periods what is now the peninsula of Lower California was a part of the mainland of Mexico, the present Gulf of California being dry land. Some of the members of this tribe of lizards migrated northward and westward, away from the foothills of the mountain ranges, finding their way to the semiarid desert regions of the Pacific coast, what is now the Cape St. Lucas region of Lower California. During the late Oligocene period the land between the desert region and the mountain foothills became submerged, creating the present Gulf of California. The ctenosaurs that were then shut off from their kindred on the mainland became adapted to the deserts, undergoing of course a few minor changes such as would aid in the preservation of the species. The chief changes were in the shortening of the dorsal crest, both in the length of the individual spines and also in the extent of the crest on the back. Color markings were effected to give greater protective resemblance; resemblance to the speckled and splotched habitat of the species. This species is called *Ctenosaura hemilopha*. Its present range is the entire southern half of Lower California and most of the islands near the peninsula, in the Gulf of California. A few individuals have been collected just across the gulf in Sonora, and as far north as Nogales, Ariz. They were in all probability carried there by man; but it is not impossible that their ancestral stock wandered there before the submergence of the Gulf of California.

In the immediate vicinity of the center of distribution of the genus four species have arisen. They probably arose in the following order: *brachylopha*, *brevirostris*, *pectinata*, and *parkeri*. As the original stock, *acanthura*, continued its migration southward, other species appeared; *clarki* and *quinquecarinata*. South of the Isthmus of Tehuantepec *acanthura* is replaced entirely by *similis*, a very active form which is abundant throughout Central America as far south as Panama. As the lizards continued their southward migration, new conditions in their surroundings led to new structural adaptations. A change in color took place, transverse stripes becoming conspicuous, and these probably serve, as in the case of the tiger, to aid in the concealment of their possessor. This coloration is associated with changes in habits in Central America. Three other smaller species, *bakeri*, *palearis*, and *defensor*, each with a very restricted habitat, have also arisen in this territory, all coming perhaps from *similis*; *bakeri* is restricted to Utilla Island, Honduras, *defensor* to northern Yucatan, and *palearis* to the

semidesert plateau region just south of the Motogua River in Guatemala. The distribution of *erythromelas* is unknown. Part of the *acanthura* group upon reaching the Isthmus of Tehuantepec turned north, following the foothills of the mountain ranges along the east coast of Mexico, where they have been collected as far north as Tamaulipas.

Early writers placed members of this genus in various genera. Shaw called his type *Lacerta acanthura*. Merrem called the same species *Uromastyx acanthurus*, while most of the early authors placed all these lizards in the genus *Cyclura*. The genus *Ctenosaura* was erected by Wiegmann in 1828, based upon *Ctenosaura cycluroides* (*Ctenosaura acanthura*), collected in Mexico by F. Deppe. Although the exact locality of Deppe's specimens is not known, it is thought that they were taken near Vera Cruz, his first landing and collecting place in Mexico.

In the spring of 1828 Deppe accompanied Doctor Schiede to Mexico, primarily to collect botanical specimens for the museum at Berlin. Zoological material was collected also, and some of the mammals, birds, and reptiles were described by Lichtenstein in 1838 and 1854. Their work was confined chiefly to eastern and southern Mexico, but some collections were made on the west coast by Deppe.

Schiede and Deppe landed at Vera Cruz and after spending several weeks in that vicinity proceeded to Jalapa, where they arrived in early August. They left Jalapa November 28 for Papantla and Misantla. While in this vicinity they collected on Orizaba and Cofre de Perote. Writing under date of October 26, 1829, from the City of Mexico,<sup>2</sup> Doctor Schiede stated that Deppe left him at Jalapa with the intention of going to California by way of Acapulco, but that he was prevented from carrying out his plans and was in the City of Mexico when he (Schiede) arrived. Schiede died about 1836 and after his death Deppe went on to California, probably by way of Acapulco and thence by vessel to Monterey or San Francisco, as he had originally planned. Early in the following year, 1837, he visited the Sandwich Islands, where he was with J. K. Townsend in Honolulu. The same year he returned to his home at Charlottenburg, about 1 mile from Berlin, where he remained until his death in 1861.

The collector and date of collection of Shaw's *Ctenosaura acanthura* are unknown, but the collection was made prior to 1802, the time the description was published. It was evidently collected in Mexico, where it is still not uncommon, since its habitat, the coastal region, is very large and contains much unsettled territory. The species *hemilopha* is common in the cape region of Lower California, while *brachylopha* is limited to southern Sinaloa, the islands, and the

<sup>2</sup> Linnaea, vol. 5, p. 477.

mainland of Nayarit. It was taken as late as 1913 at San Blas, Nayarit, by J. C. Thompson. The species *brevirostris* and *pectinata* range from Nayarit southward to Oaxaca, in company with other species of the genus, while *parkeri*, a new species, is described from specimens from Barranca Ibera, Jalisco. However, its distribution extends to Nayarit, specimens having been taken at Tres Marias by M. Forrer about 1885. The species *quinquecarinata* is known only from Tehuantepec, Oaxaca, while *clarki* has been collected at only one known locality—Ovopeo, Michoacan. The form *defensor* is very rare and has been taken only in Yucatan, but *similis* is very common throughout southern Mexico and Central America, including Panama, and is perhaps the most abundant species of the genus.

Slight variations occur throughout the genus, not only in the species but even in the individuals. It is not at all uncommon to find specimens having a different number of femoral pores on the two legs. The femoral pores are much larger in the males than in the females. Glands at the base of these pores, in both sexes, produce a brown waxy secretion which hardens and protrudes from the openings. Although its function is unknown it appears to be most conspicuous during the mating period, and it may have some significance in that connection. Furthermore, the femoral pores are not always limited to one row. Individuals have been examined in which the pores numbered 7 on each side, 5 in one row and 2 in a second row, parallel to the first. Another specimen having 7 femoral pores on each side had 6 in one row and 1 in the second-row position. Both sides were patterned alike. The number of spines or lobes making up the dorsal crest also varies considerably with the species and sex. These dorsal crest spines are larger in the males than in the females. Age also causes a difference in the size of the dorsal crest—the older specimens possessing the tallest crest.

Individuals have been examined in which the number of small flat scales separating the whorls of large spinous scales on the upper half of the tail differ on the right and left sides of the central row of caudal spines. Sometimes the first and second whorls are separated by two rows of flat scales, the second and third whorls by two rows on the right and three on the left; and occasionally one of the spinous whorls is omitted on one side, giving that side twice as many, plus one or two additional, flat scales. This arrangement of the scales does not appear to be due to the loss of any, but merely to their disarrangement, for in the succeeding rows the "omitted" scales are found crowded in; thereby evening the count on both sides of the dorsal row. The greatest variations are to be found in the coloration of the individuals. This question is discussed under the respective species involved, especially in *hemilopha* and *similis*, so it is sufficient to say at this point that the young and adults differ very greatly in coloration—

the young as a rule being more or less greenish, while the adults become darker and often marked with black or brown. In very old specimens the color oftentimes becomes a reddish or rusty brown or even black. Both young and old of some species have spots and stripes. The great number of synonyms found in this genus are probably due, at least in part, to the lack of a proper consideration of these variations.

At the beginning of this study it was thought that possibly there were some osteological characters upon which this and nearly related genera might be definitely separated. However, a careful examination of *Iguana*, *Ctenosaura*, and *Cyclura* shows only slight differences in the skull, and even these differences can not possibly be called generic differences. As a matter of fact, the only differences are to be found in the general outline of the skull, and these are no greater between genera than between species of the same genus. The skull of *Iguana* and *Cyclura* are typically iguaniform in size and shape, while in *Ctenosaura pectinata* and *similis* the skull is slightly elongated and flattened dorso-ventrally. Yet in *brevirostris* the rostrum, as indicated by the specific name, is short; the skull is not flattened but would pass for a true *Iguana*. It is impossible to distinguish between the genus *Ctenosaura* and its near allies by means of skeletal characters.

The early and most primitive forms of these lizards had very elongated tails and bodies—the true reptilian type, so to speak. Thus *acanthura*, supposedly the most primitive of the living forms of the genus, has a very long tail. It appears that as this form migrated the tail has tended to become shorter. It is interesting to note that along with the reduction in the length of the tail there is a corresponding increase in the size of the caudal spines. Also the species possessing the largest spines have the smallest bodies. The large spines on the tail will probably help to protect the species from enemies, while the small size of the body renders it undesirable as food for man, the most relentless enemy of these large lizards.

#### Genus CTENOSAURA Wiegmann

*Type*.—*Ctenosaura cycluroides* Wiegmann, 1828, Oken's Isis, p. 371 (*Ctenosaura acanthura*).

*Ctenosaura* WIEGMANN, 1828, Oken's Isis, p. 371.—GRAY, 1845, Cat. Lizards Brit. Mus., p. 191.—BOCOURT, 1870, Miss. Sci. Mex., vol. 3, Reptiles, p. 136.—COPE, 1885, Proc. Acad. Nat. Sci. Philadelphia, vol. 23, p. 262.—BOULENGER, 1885, Cat. Lizards Brit. Mus., vol. 2, p. 195.—COPE, 1886, Proc. Amer. Philos. Soc., vol. 23, p. 216; 1887, Bull. 32, U. S. Nat. Mus., p. 33.—GÜNTHER, 1890, Biol. Centr. Amer., Reptiles, Batrachia, p. 50.—COPE, 1900, Report U. S. Nat. Mus. for 1898, p. 237.—BROWN, 1904, Proc. Acad. Nat. Sci. Philadelphia, vol. 56, p. 468.—DITMARS, 1907, Reptile Book, p. 106; 1910, Reptiles of the World, pp. 140-141.—BARBOUR, 1916, Bull. Mus. Comp. Zoöl. (Part), vol. 60, No. 4, p.

- 140.—STEJNEGER and BARBOUR, 1917, Check list N. Amer. Amph. Rept., ed. 1, p. 44; 1921, Proc. New Eng. Zoöl. Club, vol. 7, p. 82.—VAN DENBURGH, 1922, California Acad. Sci. Oc. Papers No. 10, Reptiles of West. N. Amer., vol. 1, p. 64.—STEJNEGER and BARBOUR, 1923, Check list N. Amer. Amph. Rept., ed. 2, p. 42.
- Uromastyx* MERREM, 1820, Tent. Syst. Amph. (Part), p. 56, 1820.—GRAY, 1845, Cat. Lizards Brit. Mus., p. 191.
- Cyclura* HARLAN, 1824. Journ. Acad. Nat. Sci. Philadelphia, vol. 4 (Part), p. 250.—GRAY, 1827, Philos. Mag., ser. 2, vol. 2, p. 57 (Part).—WIEGMANN, 1834, Herp. Mex., pp. 15, 41 (Part).—DUMÉRIL et BIBRON, 1837, Erpét. Gén., vol. 4, p. 214-244 (Part).—FITZINGER, 1843, Syst. Rept., p. 56 (Part).—GRAY, 1845, Cat. Lizards Brit. Mus., vol. 2, p. 190 (Part).—COPE, 1868, Proc. Acad. Nat. Sci. Philadelphia, p. 283 (Part).—HEILPRIN, 1882, Proc. Acad. Nat. Sci. Philadelphia, p. 333 (Part).—CHAPMAN, 1891, Proc. Acad. Nat. Sci. Philadelphia, p. 366 (Part).
- Enyaliosaurus* GRAY, 1845, Cat. Lizards Brit. Mus., p. 192.
- Chachryx* COPE, 1866, Proc. Acad. Nat. Sci. Philadelphia, p. 124.—COPE, 1885, Proc. Acad. Nat. Sci. Philadelphia, vol. 23, pp. 262-270.—BOULENGER, 1885, Cat. Lizards Brit. Mus., vol. 2, pp. 195-198.

*Diagnosis of the genus.*—The members of this genus have the tail armed with strong spinous scales; tympanum distinct, nearly as large as orbit. The body is scarcely compressed; the scales of the median dorsal row enlarged, forming a dorsal crest. Scales of head and body small, those of the belly being smaller than those of the upper head, and those of the back being smaller than those of the belly. A very strong transverse gular fold, except in two species in which there is a large nondilatable longitudinal gular fold, the dewlap. There is a short series of femoral pores. Mandibular and maxillary teeth pleurodont, the lateral teeth only with denticulated crowns; pterygoid teeth present. The tongue is short and thick and slightly notched anteriorly, nonprotractile. Digits compressed, with keeled lamellae inferiorly, but without corneous combs or pectinations on the toes.

Of the 27 species that have been described only 13 are valid. They are *C. acanthura* (Shaw), 1802; *bakeri* Stejneger, 1901; *brachylopha* (Cope), 1866; *brevirostris* Cope, 1886; *clarki* Bailey, 1928; *defensor* (Cope), 1866; *erythromelas* Boulenger, 1886; *hemilopha* (Cope), 1863; *palearis* Stejneger, 1899; *parkeri* Bailey, 1928; *pectinata* Wiegmann, 1834; *similis* (Gray), 1831; *quinquecarinata* (Gray), 1842. These may be separated by the use of the following key to the species:

KEY TO THE SPECIES OF CTENOSAURA

- A<sup>1</sup>.—Median row of dorsal scales enlarged and extending from nape to end of tail, without interruption at the sacrum. These scales are usually large and armed with heavy spines, more pronounced in the males than in the females. Over the sacrum the crest consists of slightly raised and enlarged scales without spines.
- B<sup>1</sup>.—Head very short, rostrum conspicuously decurved.....*brevirostris*
- B<sup>2</sup>.—Head normal, rostrum not conspicuously decurved.
- C<sup>1</sup>.—First six whorls of spinous scales of the tail separated from each other by four or more rows of small, flat, smooth scales...*parkeri*



- C<sup>2</sup>.—First six whorls of spinous scales of the tail separated from each other by fewer than four rows of small, flat scales.
- D<sup>1</sup>.—The first and second or the first, second, and third whorls of spinous scales separated from each other by two or three rows of small, flat scales, the next six or eight whorls being separated from each other by two rows of small, flat scales, body marked with black cross bands terminating on belly  
similis
- D<sup>2</sup>.—First five or six whorls of spinous scales separated from each other by three rows of smaller scales, the next five or six whorls being separated from each other by two rows of smaller, flat scales. No such black bands as in D...*pectinata*
- A<sup>2</sup>.—Median row of dorsal scales low and interrupted at the sacrum, not continuous as in A<sup>1</sup>.
- B<sup>1</sup>.—Median row of dorsal scales extending only one-fourth to one-half distance to sacrum, and not noticeably raised.
- C<sup>1</sup>.—Tail armed with 13 to 20 whorls of heavy spinous scales not interspaced with whorls of small flat scales.....*defensor*
- C<sup>2</sup>.—Tail armed with whorls of spinous scales, which are interspaced with one row of small flat scales.
- D<sup>1</sup>.—Row of small flat scales very conspicuous throughout length of tail.....*clarki*
- D<sup>2</sup>.—Row of small flat scales barely detectable on basal half of tail, but noticeable on distal half.....*erythromelas*
- B<sup>2</sup>.—Median row of dorsal scales extending to or almost to sacrum, noticeably raised, of medium height.
- C<sup>1</sup>.—First two or more whorls of caudal spinous scales separated from each other by one row of small flat scales.
- D<sup>1</sup>.—Males and females possessing very pronounced dewlap  
palearis
- D<sup>2</sup>.—Not possessing dewlap but having transverse gular fold  
quinquecarinata
- C<sup>2</sup>.—Proximal whorls of caudal spinous scales separated by two or more rows of small flat scales.
- D<sup>1</sup>.—First, second and third whorls of caudal spinous scales interspaced with two rows of small flat scales, the next five or six whorls with one row of small flat scales.
- E<sup>1</sup>.—Small dewlap present.....*bakeri*
- E<sup>2</sup>.—No dewlap, transverse gular fold present, back marked with prominent black blotches or spots....*hemilopha*
- D<sup>2</sup>.—First three or more whorls of caudal spinous scales interspaced with three or more rows of small flat scales.
- E<sup>1</sup>.—First and second or first, second and third whorls of spinous scales interspaced with three rows of small flat scales.....*acanthura*
- E<sup>2</sup>.—First, second, third, fourth, and fifth whorls of spinous scales interspaced with three rows of small flat scales  
brachylopha

## DISCUSSION OF THE SPECIES

## CTENOSAURA ACANTHURA (Shaw)

Plates 1, 2, 3, 4

*Lacerta acanthura* SHAW, 1802, General Zoology, vol. 3, p. 1, p. 216.—GRAY, 1827, Philos. Mag., ser. 2, vol. 2, p. 57.

*Uromastix acanthurus* MERREM, 1820, Tent. Syst. Amph., p. 56.

- Cyclura teres* HARLAN, 1824, Journ. Acad. Nat. Sci., Philadelphia, vol. 4, pp. 242-251, pl. 26.—GARMAN, 1884, Bull. Essex Inst., vol. 16, p. 19.
- Ctenosaura cycluroides* WIEGMANN, 1828, Oken's Isis., vol. 21, p. 371.—BOCOURT, 1874, Miss. Sci. Mex., Reptiles, vol. 3, p. 143.—SUMICHRAST, 1880, Bull. Soc. Zoöl. France, vol. 5, p. 174.—IVES, 1891, Proc. Acad. Nat. Sci., Philadelphia, vol. 43, p. 459.—BROWN, 1908, Proc. Acad. Nat. Sci., Philadelphia, vol. 60, p. 117.
- Cyclura carinata* WAGLER, 1830, Nat. Syst. Amph., p. 147.
- Iguana (Ctenosaura) armata* GRAY, 1831, Cuv. Griff. Anim. Kingd., vol. 9, Synopsis, p. 38.
- Iguana (Ctenosaura) belli* GRAY, 1831, Cuv. Griff. Anim. Kingd., vol. 9, Synopsis, p. 38.
- Iguana (Ctenosaura) lanceolata* GRAY, 1831, Cuv. Griff. Anim. Kingd., vol. 9, Synopsis, p. 38.
- Cyclura articulata* WIEGMANN, 1834, Herp. Mex., pp. 42-43.
- Cyclura denticulata* WIEGMANN, Herp. Mex., pp. 42-43.—HALLOWELL, 1854, Proc. Acad. Nat. Sci., Philadelphia, vol. 7, p. 103.
- Cyclura (Ctenosaura) shawii* WIEGMANN, Herp. Mex., pp. 42-43.—FITZINGER, 1843, Syst. Rep., p. 56.
- Cyclura semicristata* FITZINGER, 1843, Syst. Rep., p. 56.
- Cyclura (Ctenosaura) articulata* FITZINGER, 1843, Syst. Rep., p. 56.
- Cyclura (Ctenosaura) belli* FITZINGER, 1843, Syst. Rep., p. 56.
- Cyclura (Ctenosaura) denticulata* FITZINGER, 1843, Syst. Rep., p. 56.
- Cyclura denticulata* HALLOWELL, 1855, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 3, p. 36.
- Cyclura acanthura* SUMICHRAST, 1864, Arch. Sci. Phys. Nat., vol. 19, pp. 49-50; 1864, Ann. Mag. Nat. Hist., vol. 13, p. 500.—COPE, 1871, Proc. Acad. Nat. Sci., Philadelphia, pp. 205-216; 1874, Journ. Acad. Nat. Sci., Philadelphia, ser. 2, vol. 8, pp. 95-124; 1879, Proc. Amer. Philos. Soc., vol. 18, p. 261; 1885, Proc. Amer. Philos. Soc., vol. 22, p. 379.
- Ctenosaura acanthura* GRAY, 1845, Cat. Lizards Brit. Mus., p. 191.—COPE, 1866, Proc. Acad. Nat. Sci., Philadelphia, p. 124.—SUMICHRAST, 1880, Bull. Soc. Zool. France, vol. 5, p. 175.—BOULENGER, 1885, Cat. Lizards Brit. Mus., vol. 2, p. 195.—GÜNTHER, 1890, Biol. Cent. Amer., Rept. Batr., p. 5.—DITMARS, 1910, Reptiles of the World, p. 141.
- Cyclura (Ctenosaura) acanthura* COPE, 1869, Proc. Amer. Philos. Soc., vol. 6, p. 161.
- Ctenosaura teres* BOCOURT, 1874, Miss. Sci. Mex., Reptiles, vol. 3, p. 142.—COPE, 1886, Proc. Amer. Philos. Soc., vol. 23, pp. 266-268; 1887, Bull. 32, U. S. Nat. Mus., p. 34.—VAN DENBURGH, 1897, Proc. Acad. Nat. Sci., Philadelphia, vol. 49, p. 461.—COPE, 1900, Rept. U. S. Nat. Mus. for 1898, p. 238.
- Cyclura (Ctenosaura) cycluroides* GARMAN, 1884, Bull. Essex Inst., vol. 16, No. 1, p. 19.
- Cyclura (Lacerta) acanthura* GARMAN, 1884, Bull. Essex Inst., vol. 16, No. 1, p. 19.
- Ctenosaura multispinis* COPE, 1885, Proc. Amer. Philos. Soc., vol. 23, p. 197 (part); 1886, p. 266-267; 1887, Bull. 32, U. S. Nat. Mus., p. 34; 1900, Rep. U. S. Nat. Mus. for 1898, p. 237-240.—DITMARS, 1907, Rept. Book, p. 107.—STEJNEGER and BARBOUR, 1917, Check-List N. Amer. Amph. Rept., ed. 1, p. 44.—VAN DENBURGH, 1922, Occ. Papers California Acad. Sci., No. 10, vol. 1, Lizards, p. 64-66.—STEJNEGER and BARBOUR, 1923, Check-List, N. Amer. Amph. Rept., ed. 2, p. 42.

*Type*.—Brit. Mus: Nat. Hist. No. XXII 20-a, Female.

*Type locality*.—Restricted to Tampico, Tamaulipas, Mexico.

*Diagnosis.*—A conspicuous transverse gular fold; median dorsal scales 65–80, considerably larger than body scales forming a serrated crest of slight elevation extending from the beginning of the neck to the sacrum; dorsal crest not even indicated by a row of carinated scales in sacral region. Tail very long and strongly marked into numerous verticilli (whorls or rings), composed of very long and very strongly carinated scales, each terminating in a lengthened point, thereby causing a spiny appearance throughout entire length of tail; whorls of spinous scales separated from each other by rows of smaller flat scales; first and second or first, second, and third whorls separated by three rows of smaller flat scales; next five or six whorls separated by two rows of smaller flat scales; a few whorls separated by one row of flat scales, these flat scales gradually becoming spinous until at or near middle of tail small flat scales disappear and tail exhibits a spiny appearance to end. (Of course a broken tail that has been regenerated does not possess the armed scales on the regenerated portion.)

*Distribution.*—This ctenosaur has the widest distribution of any member of the genus. It ranges from the States of Sonora and Chihuahua, Mexico, southward to the Isthmus of Tehuantepec, inhabiting sandy beaches and the foothills of the various mountain ranges. Most of the specimens that have been collected have been taken on the coastal slopes of the mountain ranges, very few being recorded from the interior regions. Specimens taken on the islands in the Gulf of California and at Cape St. Lucas, Lower California, were in all probability carried over from the mainland. These lizards are regarded as food by some Indians and are often carried alive from place to place for that purpose.

Many specimens in the museums in this country and in Europe bear simply the locality label "Mexico." However, enough properly labeled material has been examined to insure accurate distribution charts. Specimens have been taken at Batopilas, Chihuahua, Mexico; on the western foothills of the Sierra Tarahumare Mountains; Tampico and Manuel, Tamaulipas; Miramar, Cerro del Gallo, Jalapa, and Panuco, Vera Cruz; Escuinapa and Tres Marias Island, Nayarit; Uruapan, Michoacan; Tlopa, Guerrero; Tetela, Morelos; Tehuantepec, Domingullo (Domingville); and Cuicatlan, Oaxaca.

*Description.*—Brit. Mus. Nat. Hist. 20a. H. grown female type; Berlin No. 577, H. grown male now M. C. Z. No. 22453, cotype of *cycluroides*; M. C. Z. No. 16070 adult male. Head elongate, flat above, covered with somewhat small hexagonal scales, and very distinctly marked off, as it were, from body; muzzle narrowed, covered with rather large smooth scales; supraoculars small, flat, and hexagonal, externals only about one-half as large as internals, and separated from each other by three rows of scales; ear opening almost as large as orbit; no dewlap; transverse gular fold present; parietal scales slightly

smaller than those on muzzle; nostrils large, very near tip of snout, almost tubular, opening obliquely backward; lores flat; 9-11 enlarged supralabials; 8-10 enlarged sublabials. Dorsal scales small, hardly more than half size of ventral scales, gradually increasing in size posteriorly, smooth; a well-developed dorsal crest composed of from 65-80 carinated scales, beginning just back of head, on neck, and continuing, uninterrupted, to sacrum; in large, old males these spines are cone-like and often reach a height of 8-15 mm. Dorsal crest and caudal crest entirely separate, there being no indication of crest in sacral region. No spines on any scales of fore or hind limbs; femoral pores vary from 4-4 to 9-9. Tail slightly constricted at insertion, rounded posteriorly, at least twice as long as body in unmutilated specimens; caudal scales above and laterally, in whorls, large, spinous; whorls separated by smaller flat scales, of which the median dorsal are spinous throughout length of tail; first and second or first, second, and third whorls of spinous scales separated by 3 rows of small flat basal scales; next 10 or 12 whorls of spinous scales separated by 2 rows of small flat scales; other whorls separated by only 1 row of flat scales, which about middle of tail, also become spinous, thereby giving distal half of tail a spiny appearance throughout. At base of tail, ventral scales much smaller, three rows corresponding to each pair above, slightly keeled and pointed posteriorly. After first 3 or 4 rows ventrals and dorsals approach each other in size, 2 rows of ventrals corresponding to a like number of dorsals. Toes rather long, especially those of hind feet; claws strong and sharp.

*Measurements.*—

Type	Brit. Mus. No. 20a, F type	Cotype of <i>Ct. cyclu- roides</i> Ber- lin No. 577, M now M. C. Z. No. 22453	Large adult M. M. C. Z. No. 16074
	<i>Mm.</i>	<i>Mm.</i>	<i>Mm.</i>
Length of head.....	38	40	50
Length of body.....	130	130	165
Length of tail.....	289	310	430
Total length.....	455	480	653
Width of head over orbits.....	22	22	28

*Coloration.*—Adult: Head, neck, body, tail, and limbs dull brownish above; under parts lighter with somewhat indistinct clouds and marblings of a whitish cast. On belly and sides are three or four bands of faded slate or bluish green which extend up and across back, being hardly visible except where dorsal crest spines are involved. A few very large males exhibit blotches of rusty red or cinnamon over body, especially on sides and shoulders. Large adults of this species are often referred to as "Black Ctenosaurs."

It seems that dried skins lose most of their color, so great weight should not be given to descriptions made from such specimens.

A few color descriptions representing the observations of different students on various sized specimens, under different conditions, may be of interest, hence the following notes:

Shaw in his original description of *Ctenosaura (Lacerta) acanthura*, based upon an alcoholic specimen, which was not more than half grown, says:<sup>3</sup> "Upper part glaucous, variegated with a few small and somewhat indistinct clouds and marblings of a whitish cast. The tail and underparts are of a pale or yellowish color."

Harlan, who in 1824 described and figured *Ctenosaura (Cyclura) teres*<sup>4</sup> from a living specimen in the Museum of the Philadelphia Academy of Natural Science, gives us this description: "Color of this species dark green, on some parts of his back brilliant or glistening." Although there is no record of this specimen ever having been preserved, the description together with the splendid illustration of the specimen leaves no doubt as to its identity with *Ctenosaura acanthura*.

In writing of the color of the young of this species Wiegmann<sup>5</sup> says: "The color of the upper parts in this young specimen is a splendid yellowish green intermingled with bluish green and cloudy black-brown cross spots; three brown cross stripes go over the cheeks to the ear; the legs are sprinkled with numerous spots and the tail is ringed with brown. But this uncommon, beautiful coloring seems to disappear with advancing age." He also says concerning older specimen that "A somewhat larger example shows faded bluish-green, or rather a green and blue glittering gray sprinkled with numberless black dots. Upon them no traces of other marks are left visible."

Cope,<sup>6</sup> who described *Ctenosaura multispinis*, a synonym of *acanthura*, from a full-grown male, says: "Color above and below black." The writer examined this type of *multispinis*, which is a stuffed skin, and found it to be a true *acanthura* and that the underparts showed indistinct whitish markings, just as do most of the larger specimen.

Gunther<sup>7</sup> says:

The coloration varies and changes with age. The ground color of the young is generally green, marbled with darker on the back, the dark markings forming more or less distinct, irregular cross bands, which are sometimes confluent, sometimes spotted with black, and about seven or eight in number on the back. With age the dark color becomes more diffused and irregularly distributed over the body, at places entirely suppressing the ground color, which itself assumes a more olive tinge or changes into yellowish. Specimens from Tampico are uniform black when adult, and of a greenish-olive when young.

*Remarks.*—Originally *Ctenosaura acanthura* was described by Shaw in 1802 from a half-grown female specimen, the date and place of collection and the name of the collector being unknown.

<sup>3</sup> Shaw, George. General Zoölogy, vol. 8, part 1, p. 216, 1802.

<sup>4</sup> Harlan, R. Journ. Acad. Nat. Sci. Philadelphia, vol. 4. pp. 242-251, pl. 26, 1824.

<sup>5</sup> Wiegmann, V. J. Oken's Isis., p. 371, 1828.

<sup>6</sup> Cope, E. D. Proc. Amer. Philos. Soc. Phila., vol. 23, p. 267, 1886.

<sup>7</sup> Gunther, A. C. L. G. Biol. Cent. Amer. Rept. Batr., p. 57, 1890.

In the spring of 1824 a living specimen was brought from Tampico, Tamaulipas, Mexico, by Captain Dallas, and presented to the Academy of Natural History, Philadelphia, where it remained alive for several months. Mr. Harlan of the Academy Museum observed this lizard for several months, and in November, 1824, published a description of the specimen and notes on its habits in captivity. The plate accompanying the description makes it very clear that this species, which he called *Cyclura teres*, is in reality only an adult of *Ctenosaura acanthura*. With this evidence in hand and with records of many additional findings of this species in the Tampico district, I hereby restrict the type locality of *Ctenosaura acanthura* to Tampico, Tamaulipas, Mexico.

Wiegmann published in 1828 an account of a new species, *Ctenosaura cycluroides*,<sup>8</sup> based upon three specimens collected by Deppe in "Mexico," the same year, and deposited in the Zoologische Museum at Berlin, Germany. He created the genus *Ctenosaura* at this time. His specimens were kept together as cotypes, No. 577, a male, and Nos. 576 and 578, females. All were the same size and not over one-third grown. No. 577, a cotype, is now in possession of the Museum of Comparative Zoölogy (M. C. Z. No. 2253), Cambridge, Mass., received in exchange. The three specimens are certainly *Ctenosaura acanthura*. A few years after describing *Ctenosaura cycluroides*, Wiegmann, for some unknown reason, decided to redescribe these same specimens. Accordingly he gave up the genus *Ctenosaura*, that he had created in 1828, went back to the old genus *Cyclura* and redescribed them in 1834 as *Cyclura denticulata*,<sup>9</sup> using specimen 578 as the type. In describing *Cyclura denticulata* Wiegmann even lists *Ctenosaura cycluroides* as a synonym, but he assigns no reason for putting away the original name. Perhaps he liked the new name better. At any rate the types of both species were the same individuals, in the same containers and they bore the same accession numbers, locality labels, and collector's name, all in the handwriting of Wiegmann himself. How does the writer know these facts? Because in examining the jar containing specimen number 577 the large printed label bearing the name *Cyclura denticulata* accidentally became saturated with alcohol and water and slipped down the side of the jar, thereby exposing the original label. The other jars were treated similarly and yielded like results. A check-up on the specimens, with the curator of the department in question, revealed the fact that the specimens were the same individuals, only the original accession numbers of *Ctenosaura cycluroides* being listed.

In the same publication Wiegmann described a new species, *Cyclura articulata*, giving as a synonym *Iguana (Ctenosaura) armata*, which was described by Gray in 1831,<sup>10</sup> and which is *Ctenosaura acanthura* of

<sup>8</sup> Wiegmann, V. J. Oken's Isis., p. 371, 1828.

<sup>9</sup> Wiegmann, V. J. Herpetologica Mexicana, pp. 43-44, 1834.

<sup>10</sup> Gray, (Cuvier) Griffith's Animal Kingdom, vol. 4, p. 38, 1831.

Shaw. Again he assigns no reason for changing the name of a species. Fortunately, however, neither of his last two species were ever recorded as distinct, the "law of priority," although not known as such at that time, having taken care of the situation.

In 1886 Cope published the description of *Ctenosaura multispinis*,<sup>11</sup> based upon an adult male dried skin from *Dondominguillo* (*Dondomingville*), Oaxaca, Mexico. A careful examination of this specimen and comparison with others indicates very conclusively that it is merely a "dark phase," or mature individual of *acanthura*. As a matter of fact the large specimens of *acanthura* are commonly known as black ctenosaurs.

Perhaps the most interesting observations made on this species are recorded by Ditmars.<sup>12</sup> He says:

The old lizards are generally uniform jet black with marblings of olive or even exhibiting reddish blotches. They are surly brutes, immediately showing fight when cornered, not only endeavoring to bite, but dealing ugly blows with the generously spiked tail. From painful experience the writer (Ditmars) can testify that a blow from the spiny tail is capable of producing a severe laceration. If an avenue of escape is open, most specimens prefer flight to combat. If discovered while sunning in their favorite position, on top of a rock in a forest opening, the creature hurls himself into the shrubbery making as much noise as a frightened cow, as it goes away to a considerable distance. This species is not much in the habit of ascending trees; it can, however, climb fairly well. On the ground it is very fleet, running with the body high, the tail slightly elevated. A strong lizard can easily outrun a man as to speed, invariably escaping by darting into a thicket. Very young specimens are uniform, bright emerald green. They are persistently terrestrial, running on their hind legs in kangaroolike fashion when frightened. Observations made in large yards with a number of species of lizards, however, have demonstrated to the writer that the habit is prevalent among many of the long-bodied lacertilians of both the Agamidae and the Iguanidae. He has thus far noted the habit among 10 genera. It seems probable we have here a hereditary character, handed down from gigantic reptiles of the past, for several of those creatures, now known only by the ponderous fossils imbedded under mountains of rock, were constructed to stalk about on their powerful hind legs.

In its natural environment *acanthura* is thought of as being strictly vegetarian in its diet, but the dissection of many stomachs shows that it also is very fond of insects.

Harlan<sup>13</sup> observed that a specimen living in the Philadelphia Museum for several months ate nothing of its own accord, but that when raw meat or fruit was placed in its mouth, would swallow it leisurely without chewing. He showed a preference for raw meat, and always rejected cooked meat. During the summer the specimen subsisted chiefly on fruit and was never observed to drink. During the autumn (November, 1824) he became considerably torpid, remaining in one position for hours, without any disposition to move unless roused, when he displayed considerable activity. He became

<sup>11</sup> Cope, E. D. Proc. Amer. Philos. Soc. Phila., vol. 23, p. 267, 1886.

<sup>12</sup> Ditmars, R. L. The Reptiles of the World, p. 141, 1910.

<sup>13</sup> Harlan, R. Journ. Acad. Nat. Sci. Philadelphia, vol. 4, pp. 242-251, 1824.

exceedingly tame, and was fond of being washed with a wet sponge. He showed no disposition to bite, but when teased or tickled on the leg defended himself with his prickly tail, with which he was able to strike in every direction.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
Brit. Mus.: XXII 20a.	F.	Half grown.	"Mexico"-----	Prior to 1802.	(?)-----	Type.
	F.	Adult-----	Tampico, Tamau- lipas, Mexico.	Nov. 13, 1889.	Richardson-----	
	3F.	do-----	Tres Marias, Na- yarit, Mexico.	Oct. 1, 1881...	Forrer-----	
	2M.	do-----	do-----	do-----	do-----	
	3F.	Half grown.	Tetela, Morelos, Mexico.	Sept. 30, 1903.	Dr. H. Gadow--	
2M.	Adults-----	do-----	do-----	Apr. 11, 1866.	Purchase-----	
Berlin Mus.: 576-----	F.	Half grown.	Mexico-----	1828-----	F. Deppe-----	Cotype <i>Cyclu- roides</i> .
577-----	M.	do-----	do-----	1828-----	do-----	Do.
578-----	F.	do-----	do-----	1828-----	do-----	Cotype <i>Cyclu- roides</i> and type <i>denticu- lata</i> .
A.M.N.H.: 1549-----		do-----	Guerrero, Mexico.	(?)-----	Nevins-----	10 specimens.
1552-----		do-----	Escuinapa, Sina- loa, Mexico.	(?)-----	J. H. Batty-----	
1586-----		do-----	do-----	(?)-----	do-----	
1595-----		Young-----	do-----	(?)-----	do-----	
U.S.N.M.: 6403-----	M.	do-----	Mirador, Vera Cruz, Mexico.	(?)-----	Dr. C. Sartorius.	
10234-----		do-----	Uruapax, Micho- acan, Mexico.	1879-----	Professor Duges.	
20168-72...		Half grown.	Tehuantepec, Oaxaca, Mexico.	Aug. 29, 1892.	P. L. Jouy-----	
24361-2-----			Isabel Island, Tres Marias Island, Mexico.	Apr. 23, 1897.	E. W. Nelson---	
26341-----			Panuco River, about 80 miles above Tampico, Mexico.	(?)-----	W. Odell-----	
30430-----	F.	Half grown.	Tehuantepec, Oaxaca, Mexico.	(?)-----	F. Sumichrast--	
46835-----	F.	do-----	Cuicatlan, Oaxaca, Mexico.	Oct. 12, 1894.	Nelson and Goldman.	
46860-----	F.	Young-----	Tlapa, Guerrero, Mexico.	Dec. 2, 1894.	do-----	
47194-----	M.	do-----	Cuicatlan, Oaxaca, Mexico.	Oct. 9, 1894.	do-----	
58137-----			Balsas, Guerrero, Mexico.	1901-----	J. Hurter-----	
58498-----	M.	Half grown.	Tehuantepec, Oaxaca, Mexico.	1905-----	do-----	
71634-----	M.	do-----	Isabel Island, Na- yarit, Mexico.	(?)-----	J. R. Slevin---	
71635-----	F.	do-----	Tres Marias Is- land, Nayarit, Mexico.	(?)-----	do-----	
72737-----	M.	Adult-----	Dondominguilla, Oaxaca, Mexico.	1824-----	Captain Dallas.	Type of <i>multi- spinis</i> .
M.C.Z.: 2847-----	F.	Half grown.	"Jalapa," Mexico.	November, 1872.	E. R. Mantes---	
6850-----	M.	Adult-----	Chihuahua, Mex- ico.	-----	-----	
16073-----		Young-----	Cerro del Gallo, Vera Cruz, Mexico.	1921-----	E. R. Dunn-----	
16074-----	M.	Adult-----	Cerro del Gallo.	1921-----	do-----	
17481-----	M.	Half grown.	Manuel, Tamau- lipas, Mexico.	Oct. 27, 1922.	W. W. Brown--	
19246-----	F.	do-----	Panuco, Vera Cruz, Mexico.	Apr. 16, 1923.	do-----	
22453-----	M.	do-----	"Mexico"-----	1828-----	F. Deppe-----	Formerly Ber- lin cotype No. 577.



## CTENOSAURA HEMILOPHA (Cope)

## Plate 5

*Iguana acanthura* BLAINVILLE, 1835, *Nouv. Ann. Mus.*, vol. 4, p. 288, pl. 24, fig. 1.  
*Cyclura acanthura* DUMÉRIL and BIBRON, 1837, *Erpétologie Générale*, vol. 4, p. 22 (part).—YARROW, 1883, *Bull. 24*, U. S. Nat. Mus., pp. 11, 71.—BELDING, 1887, *West. Amer. Scientist*, vol. 3, No. 24, p. 98.

*Ctenosaura species* BAIRD, 1859, *Proc. Acad. Nat. Sci. Philadelphia*, p. 300.

*Cyclura (Ctenosaura) hemilopha* COPE, 1863, *Proc. Acad. Nat. Sci. Philadelphia*, p. 105-106; (Type locality, Cape St. Lucas, Lower Cal.); 1875, *Bull. No. 1*, U. S. Nat. Mus., pp. 50, 93.—YARROW, 1883, *Bull. 24*, U. S. Nat. Mus., pp. 11, 71, 189.—GARMAN, 1884, *Bull. Essex. Inst.*, vol. 16, No. 1, p. 19.—BELDING, 1887, *West. Amer. Scientist*, vol. 3, No. 24, p. 98.

*Ctenosaura hemilopha* COPE, 1866, *Proc. Acad. Nat. Sci. Philadelphia*, p. 312.—BOULENGER, 1885, *Cat. Lizards Brit. Mus.*, vol. 2, p. 197.—COPE, 1886, *Proc. Amer. Philos. Soc.*, vol. 23, p. 266; 1886, *Proc. Acad. Nat. Sci., Philadelphia*, p. 312; 1887, *Bull. 32*, U. S. Nat. Mus., p. 33.—VAN DENBURGH, 1895, *Proc. California Acad. Sci.*, ser. 2, vol. 5, p. 88.—MOCQUARD, 1899, *Nouv. Arch. Mus. Hist. Nat. Paris*, ser. 4, vol. 1, p. 300.—COPE, 1900, *Rept. U. S. Nat. Mus. for 1898*, p. 238, fig. 17.—DITMARS, 1907, *Reptile Book*, p. 107.—TOWNSEND, 1916, *Bull. Amer. Mus. Nat. Hist.*, vol. 35, p. 430.—STEJNEGER and BARBOUR, 1917, *Check list, N. Amer. Amph. Rept.*, p. 44.—VAN DENBURGH and SLEVIN, 1921, *Proc. California Acad. Sci.*, ser. 4, vol. 11, No. 4, pp. 50, 55.—NELSON, 1921, *Mem., Nat. Acad. Sci.*, vol. 16, No. 1, pp. 84, 114, 115, 123.—TERRON, 1921, *Mem. 7, Rev. Soc. Cient. Antonio Alzate*, vol. 29, pp. 164, 165, 168.—VAN DENBURGH, 1922, *Occ. Papers California Acad. Sci.*, No. 10, *Rept. West. N. Amer.*, vol. 1, p. 66.—STEJNEGER and BARBOUR, 1923, *Check list N. Amer. Amph. Rept.*, ed. 2, p. 42.

*Ctenosaura acanthura* BOCOURT, 1874, *Miss. Sci. Mex. Reptiles*, p. 138.

*Ctenosaura interrupta* BOCOURT, 1882, *Le Naturaliste*, vol. 2, No. 6, p. 47.

*Cyclura teres* YARROW, 1883, *Bull. 24*, U. S. Nat. Mus., pp. 11, 71.—BELDING, 1887, *West. Amer. Scientist*, vol. 3, No. 24, p. 98.

*Ctenosaura conspicuosa* DICKERSON, 1919, *Bull. Amer. Mus. Nat. Hist.*, vol. 41, Art. 10, p. 461.—NELSON, 1921, *Mem. No. 1, Nat. Acad. Sci.*, vol. 16, p. 171.

*Ctenosaura insulana* DICKERSON, 1919, *Bull. Amer. Mus. Nat. Hist.*, vol. 41, Art. 10, pp. 462, 463.—NELSON, 1921, *Mem. Nat. Acad. Sci.*, vol. 16, No. 1, pp. 114, 115, 171.

*Type*.—From 4 cotypes, No. 529, U.S.N.M.

*Type locality*.—Cape St. Lucas, Lower California, Mexico; John Xantus, collector.

*Diagnosis*.—Dorsal crest confined to anterior three-fourths of back, shoulder, and neck region; never continued on the posterior fourth of back. Four or five black blotches on vertebral line, separated by areas paler than the general tint. First black marking small, second broader than long and faintly continuous with the blackish brown on the ventral surface. Fifth almost confined to the median scales.

*Distribution*.—This species occurs in the southern two-thirds of the Lower California Peninsula, specimens having been taken at Cape St. Lucas (the type), San Jose del Cabo, Miraflores, La Paz, San

Pedro, Santa Anita, San Antonio, San Bartolo, Buena Vista, Santiago, Agua Caliente, Sierra San Lozaro, Pescadero, Trumfo, Todos Santos, and Hanson Laguna. It has also been taken on the following islands in the Gulf of California: Geralbo, San Esteban, and San Pedro Nolasco.

The questionable occurrence of this species on the mainland of Mexico is mentioned below under the remarks on the species.

Van Denburgh, who in all probability examined and studied more individuals of this species than any other worker, published in 1922<sup>14</sup> the most accurate account concerning it. From this paper I have quoted freely, placing in quotation marks the extracts taken therefrom. The description which follows immediately has been slightly modified according to my observations.

*Description.*—U.S.N.M. No. 69489-H, grown cotype; M. C. Z. No. 13179, adult male; 3178, adult male; A. M. N. H. No. 2073, adult male. Body considerably compressed. Tail conical at base, where almost square in sections. Limbs and head large, latter sharply triangular with flattened top and almost vertical sides. Nostrils large, in a round plate whose posterior edge is nearer to orbit than to end of snout. Rostral and symphyseal plates very broad and low. Ten labials. A very large plate below the eyes; a series of large superciliaries. Entire top and sides of head covered with small, irregular hexagonal plates, convex, except on snout and lores. Ear opening very large, almost vertical, and without denticulation. Several series of large sublabial plates, passing gradually into gulars. Dorsal crest begins some distance behind shielded part of head, is composed of high spines on nape, and gradually diminishes in height posteriorly. It is continued on middle third of vertebral line of body as a series of enlarged flat plates, but is not traceable on posterior third. Back and sides covered with small, smooth, subquadrate scales, which pass gradually into larger ventrals. Gular region covered with smooth scales, which become gradually larger posteriorly. Smallest gulars larger than dorsals, the largest smaller than ventrals. Scales on limbs all smooth. Tail bearing whorls of spinous scales; the first and second, and occasionally the third, of these whorls separated from each other by three series of smaller smooth scales; third, fourth, fifth, and sixth spiny whorls each preceded by two series of smooth scales, and the more distal whorls by single series which gradually become spinous. Number of femoral pores ranges from four to eight on each side. Dorsal crest higher in males than in females, but never continued on posterior part of back.

<sup>14</sup> Van Denburgh. Occ. Papers of California Acad. of Sci., No. 10. The Rept. of W. N. Amer., Part I, Lizards, pp. 67-71, 1922.

*Measurements.*—

	M. C. Z. No. 3178 M.	A. M. N. H. No. 2073 M.
	<i>Mm.</i>	<i>Mm.</i>
Length of head.....	38	75
Length of body.....	115	185
Length of tail.....	275	420
Total length.....	428	680
Width of head over orbits.....	20	35

The following paragraphs are taken from Van Denburgh:

*Coloration.*—The top and sides of the head are dull pea green. The back, sides, and hind limbs are pale straw color, heavily washed with pale olive, and spotted and reticulated with seal brown and black. There are five black blotches on the vertebral line, separated by areas paler than the general tint. The first of these black markings is very small; the second is broader than long; the third and fourth are very large and faintly continuous with the blackish brown of the ventral surface; the fifth is almost confined to the enlarged medial scales. There are two longitudinal black blotches on the side of the neck and two corresponding lines on the temple. The chin, gular region, chest, and fore limbs are blackish brown. The tail has a ground color of straw yellow clouded with olive, but is dull pea green on the spines, and barred with seal brown terminally.

The youngest individuals (58 to 76 mm. from snout to vent) are bright terre-verte green above, except on the tail, which has broad rings of dark olive separated by narrow ones of broccoli brown. There are very faint indications of dark vertebral bars. The lower parts are yellowish white, tinged with green. As the animals increase in size the green gradually disappears and the dark markings increase in size and number until adult coloration is assumed.

A living specimen was colored as follows: The back and sides are grayish, mottled with black. Three transverse black bands across the shoulders. The upper surfaces of the fore limbs are black, spotted with gray; of the hind limbs, gray mottled with black. The gular region is black, bordered with gray. The ventral surface between the fore limbs is black. The belly is grayish. The tail in all specimens is ringed with alternate wide bands of brown and yellow.

*Remarks.*—This large lizard is very common in many parts of the cape region of Lower California, Mexico, where it lives either among rocks or trees. It ordinarily lives upon vegetable food, but it may eat crabs when its usual food is scanty. It is locally known as the iguana and is eaten by the natives. Its spiny tail is used by it as a means of defense.

Mr. J. R. Slevin,<sup>15</sup> of the California Academy of Science, says of this species:

It is fairly abundant where found and inhabits the large granite boulders in company with *Uta thalassina*. Where boulders are not plentiful these iguanas resort to trees. At San Bartolo they were seen only among the granite boulders, which abound in that vicinity, but at San Pedro and Agua Caliente they were found in the trees; none were observed on the ground. They seem to live

<sup>15</sup> Occ. Papers of Calif. Acad. of Sci., No. 10, pp. 67-71, 1922.

strictly on vegetable matter, and the stomachs of the specimens collected contained the leaves of one of the common trees. On breaking off a hollow limb of a tree, at San Pedro, a specimen was found so tightly wedged within that it could be secured only by cutting it out with a small hand ax. They have the same habit as our chuckwalla (*Sauromalus ater*) of getting into crevices and holding tight by puffing up the body. Large specimens are very rare, as the natives kill them for food whenever they find one of desirable size. They are somewhat vicious when captured, and when held by the tail will always keep the mouth open ready to seize whatever comes within reach.

In *Ctenosaura hemilopha* there is great variation in the height and length of the dorsal crest and the point at which the enlarged series of scales stops on the back. Also there is great variability in the size of the large caudal scales and of the keeling on the scales of the limbs. Perhaps the greatest variation is in the color of the individuals. The black markings which serve as one of the most striking characteristics of the species vary in number, size, and shape. The ground color includes all shades between a pale yellowish gray to a dark slaty brown. Indeed, the diversity is so great as to lead one to doubt the distinctiveness of several species that have been described since *hemilopha* was first described. Blainville,<sup>17</sup> prior to the establishment of this species, described and figured it, calling it *Iguana acanthura*, thinking it to be Shaw's *acanthura*. For many years workers confused this species with *acanthura*. Cope, in 1863,<sup>18</sup> was the first to recognize the distinction and accordingly published his description, taken from four cotypes, received from Cape St. Lucas, Lower California. He placed it in the genus *Cyclura*, but later, 1866, placed it in the genus *Ctenosaura*.

In 1882 Bocourt<sup>19</sup> described *Ctenosaura interrupta* from specimens of *hemilopha* collected by M. Botta in Lower California. An examination of the types in Paris, and one of the cotypes in the British Museum, leaves no doubt as to their being true *hemilopha*. They agree in every respect with Cope's types, in Washington.

The species, *insulana*, based upon specimens from Ceralbo Island and *conspicuosus* from San Esteban Island, were described in 1919 by Dickerson.<sup>20</sup>

Concerning these species Van Denburgh says:

With good series of specimens from both these islands and from San Pedro Nolasco Island and the cape region of Lower California before me, I am unable to detect any difference in proportions or in coloration, or in the size of the spines of the caudal whorls, or the height or length of the dorsal crest, which are not fully covered by individual variation in each locality. As regards the keeling and mucronation of the scales of the legs and foot, the same is true, great individual variation in the strength of the keeling and mucronation being

<sup>17</sup> Blainville, de, Nouv. Ann. Mus., vol. 4, p. 238, pl. 24, fig. 1, 1835.

<sup>18</sup> Cope, Proc. Acad. Nat. Sci. Philadelphia, pp. 105-106, 1863.

<sup>19</sup> Bocourt, Le Naturaliste, vol. 2, No. 6, p. 47, 1882.

<sup>20</sup> Dickerson, Bull. Amer. Mus. Nat. Hist., vol. 41, pp. 461-462, 1919.

found in all four localities. These specimens, therefore, are all referred to the one species, *Ctenosaura hemilopha*. Femoral pores in specimens from San Esteban Island vary from 5 to 8; in those from San Pedro Nolasco Island, from 6 to 9; in 10 from Ceralbo Island, from 6 to 8; in 50 from the cape region, from 4 to 7.

The writer examined the types of *Ctenosaura insulana* and *conspicuososa* and could find no characters that are not included in the normal individual variations of *hemilopha*.

Three young specimens belonging to the United States National Museum (No. 13484), collected at Guaymas, on the west coast of Sonora, and labeled "*Ctenosaura multispinis*" are *hemilopha*. Another specimen, U.S.N.M. No. 17178, also labeled "*Ctenosaura multispinis*," and said to have been collected at Nogales, Ariz., is a three-fourths grown male of *hemilopha*. Concerning the latter the United States National Museum catalogue record shows that it was "brought into town by a boy who was leading it around by a string." George B. Marsh procured the specimen from the boy, and turned it over to P. L. Jouy, who sent it to the Museum at Washington.

The three young specimens from Guaymas were in all probability reared in that vicinity, the original stock having been taken there by travelers from one of the islands of the Gulf of California or from the mainland of Lower California. The Arizona record is very doubtful.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
U.S.N.M.: 5295		Halfgrown	Sorio Rancho, Lower California, Mexico.	1859	J. Xantus	3 cotypes.
12263			Cape St. Lucas, Lower California, Mexico.	(?)	do	
12651			Miraflores, Lower California, Mexico.	1882	L. Belding	
12652			La Paz, Lower California, Mexico.	(?)	do	
12654			do	1882	do	
12655			Miraflores, Lower California, Mexico.	1882	do	
12656			La Paz, Lower California, Mexico.	1882	do	
13484	M.	Young	Guaymas, Sonora, Mexico.	1883	H. F. Emeric	3 specimens.
17178	M.	Halfgrown	Nogales, Ariz.	1890	P. L. Jouy and G. B. Marsh.	
21460			Lower California, Mexico.	(?)	L. Belding	
24686-93			Cape St. Lucas, Lower California, Mexico.	1859	J. Xantus	8 specimens.
24694	M.	Halfgrown	Santiago, Lower California, Mexico.	December, 1859	do	
37578-9			Santa Anita, Lower California, Mexico.	Jan. 15, 1906	Nelson and Goldman.	2 specimens.
37580-1			Cape St. Lucas, Lower California, Mexico.	Jan. 1, 1906	do	Do.

*Material examined.*—Continued.

Specimen	Sex	Age	Locality	Date	Collector	Remarks
U.S.N.M.: 37582			San Jose del Cabo, Lower California, Mexico.	Jan. 10, 1900.	Nelson and Goldman.	
46885			do	Apr. 3, 1895.	J. E. McLellan.	
47172			do	do	do	
47958			Rio Mayo, Camoa Sonora, Mexico.	Jan. 22, 1899.	E. A. Goldman.	
58334-6			Lower California, Mexico.	(?)	J. Hurter	3 specimens.
64439	M.	Adult	Cerralvo Islands, Lower California, Mexico.	1911.	C. H. Townsend.	Type of <i>Ct. insulana</i> .
64440	M.	do	San Esteban Island, Lower California, Mex- ico.	1911.	do	Type of <i>Ct. conspicuosa</i> .
64551-2			do	1911.	do	2 specimens.
64553			Cerralvo Islands, Lower California, Mexico.	1911.	do	
64554-9			Miraflores, Lower California, Mex- ico.	1911.	do	6 specimens.
69536			Lower California, Mexico.	(?)	J. Xantus	
69489		Half grown.	San Nicholas, Cape St. Lucas, Lower California, Mexico.	September, 1859	do	1 cotype.
A.M.N.H.: 5639-41	F.	Adult	Lower California, Mexico.	1911.	Albatross Expe- dition.	3 specimens
5657	M.	do	do	1911.	do	
5658	M.	Half grown.	do	1911.	do	
20738	F.	do	do	1911.	do	
20739	M.	Adult	do	1911.	do	
M.C.Z.: 6817	M.	Young	Miraflores, Lower California, Mex- ico.	1903.	G. Gisen.	2 specimens.
7087	M.	do	do	1903.	do	
10438	M.	Adult	Cape St. Lucas, Lower California, Mexico.	1859.	J. Xantus.	
13178-9	M.	do	San Pedro Island, Lower California, Mexico.	1909.	J. R. Slevin	Do.
15874-5	M.	do	Cerralvo Island, Lower California, Mexico.	1922.	do	Do.
15878	F.	do	San Esteban Is- land.	1922.	do	
Brit. Mus.	M.	Half grown.	Lower California, Mexico.	(?)	M. Botta	Cotype of <i>Ct. interrupta</i> .
	M.	do	do	(?)	(?)	
Paris Mus.: 2243		Adult	do	(?)	M. Botta	Do.
2245		do	do	(?)	do	Do.
2295		do	Mexico.	1895	(?)	
2843		do	Lower California, Mexico.	(?)	M. Botta	Do.
96-120	M.	do	do	(?)	Diguet	
96-121	M.	do	do	(?)	do	
97-438		Half grown	do	(?)	do	

## CTENOSAURA BRACHYLOPHA (Cope)

## Plate 6

*Ctenosaura teres brachylopha* COPE, 1886, Proc. Amer. Philos. Soc., vol. 23, p. 269; 1887, Bull. 32, U. S. Nat. Mus., p. 24.

*Cotypes*.—Cat. Nos. 7180, 7181, 7182, 7183, U.S.N.M. Females.  
*Type locality*.—Mazatlan, Sinaloa, Mexico, 1867; Bischoff, collector.

*Diagnosis.*—This species resembles somewhat *Ctenosaura pectinata* and *brevirostris*, but may be distinguished from either of them by the absence of the median dorsal crest over the sacral region. Dorsal crest made up of 65 to 75 short processes and extends only to beginning of sacral region. First, second, third, fourth, fifth (and occasionally the sixth) caudal whorls of spinous scales separated by three rows of small flat basal scales.

*Distribution.*—This species is found on the low coastal plains of western central Mexico. It has been collected in the States of Nayarit and Sinaloa, and it probably occurs also in Jalisco. The type specimens were collected by Bischoff near Mazatlan, in Sinaloa. Other specimens have been collected at Culiacan, Sinaloa, Tepic, San Blas, Maria Madre Island, Tres Marias Island, and Maria Cleofas Island, Nayarit.

*Description.*—U.S.N.M. Nos. 7180, adult female stuffed skin, 24630 adult male alcoholic specimen. Head normal in length, covered with small hexagonal scales; muzzle slightly decurved. Scales on muzzle larger than other head scales; supraocular small, being separated from each other by three or four rows of scales; nostrils large, much nearer tip of snout than to orbit, almost tubular, opening obliquely backward; rostral larger than mental; lores flat; 10 to 13 enlarged supralabials; 10 to 12 enlarged sublabials; ear opening as large or almost as large as orbit. Dorsal scales small and smooth, hardly more than half the size of ventrals, being almost granular on neck and gradually increasing in size posteriorly. Dorsal crest made up of 65–75 very short processes, which appear as merely elongated compressed scales, longer than high, except on interscapular region, where they are as high as long. Three scales on the canthus rostralis, of which the posterior is longer than deep, second deeper than long, and third, adjacent to nares is deeper than long, and divided into a superior and an inferior plate; transverse gular fold present; scales on fore and hind legs not spinous. Caudal scales above and laterally in whorls of spinous and flat scales; first seven whorls of spinous scales being separated from each other by three rows of small flat basal scales; next seven whorls by two rows of flat scales and the remainder by one row which itself finally become spinous, giving the distal third of tail a completely spinous appearance. Lower surface of tail covered with transverse series of smaller scales, strongly keeled and pointed posteriorly. Femoral pores 6–6 to 8–8.

*Measurements.*—

Cotype U.S.N.M.  
No. 7180, female.

Length of head.....	45 mm.
Length of body.....	165 mm.
Length of tail.....	310 mm.
Total length.....	520 mm.
Breadth of head over orbits.....	23 mm

*Coloration.*—Cope, in his original description, says: "The color is apparently green in life, punctuated with blackish brown. The punctuations arrange themselves into a row of median dorsal spots, and in three of the specimens into transverse bands near the middle of the sides of the abdomen. Tail with broad blackish rings."

*Remarks.*—This species grows to be as large as any of the Ctenosaurs, a large male specimen, from Cleofas Island, measuring over 1,000 millimeters from tip of rostrum to tip of tail. The food of this species consists largely of the leaves of trees and smaller plants.

Dr. E. W. Nelson,<sup>21</sup> who collected extensively in Mexico, found that this species was "rather common, living mainly in hollow trees and in brushy places." The highest elevation at which he collected the species was 500 feet.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
U.S.N.M.: 7180	F.	Adult	Mazatlan, Sinaloa, Mexico.	1867	Bischoff	Cotype.
7181	F.	do	do	1867	do	Do.
7182	F.	do	do	1867	do	Do.
7183	F.	do	do	1867	do	Do.
14078	F.	Young	Tres Marias Islands, Nayarit, Mexico.	(?)	A. Forrer	
24623	F.	Half grown.	María Madre Island, Nayarit, Mexico.	May 14, 1897	Nelson and Goldman.	
24624	F.	Young	do	May 15, 1897	do	
24625	M.	do	do	do	do	
24626	F.	do	do	do	do	
24628	M.	Half grown.	do	May 24, 1897	do	
24629	M.	Adult	do	do	do	
24630	M.	do	María Cleofas Islands, Nayarit, Mexico.	May 29, 1897	do	Very large
31286	M.	Young	(?)	(?)	Boucard	
47956	M.	Adult	Sinaloa, Mexico.	Apr. 4, 1899	Nelson and Goldman.	
47957	F.	Half grown.	do	do	do	
51407	F.	do	San Blas, Nayarit, Mexico.	1913	J. C. Thompson	
58752	F.	do	Tepic, Nayarit, Mexico.	October, 1897	J. Hurter	
58753	F.	Young	Sinaloa, Mexico.	do	do	
60988	M.	Half grown.	(?)	(?)	R. W. Shufeldt	
65138	M.	Young	Tepic, Nayarit, Mexico.	1897	Nelson and Goldman.	
70665	F.	Half grown.	Culiacan, Sinaloa, Mexico.	Mar. 27, 1926	H. Meerschiedt.	

CTENOSAURA PECTINATA (Wiegmann)

Plates 7, 8, 9, 10, 11

*Cyclura pectinata* WIEGMANN, 1834, Herpt. Mex., pl. 2, p. 42.—DUMÉRIL et BIBRON, 1837, Erpét. Gén., vol. 4, pp. 217–221.—FITZINGER, 1843, Syst. Rept., p. 56.—COPE, 1886, Proc. Acad. Nat. Sci. Philadelphia, p. 124.—BOCOURT, 1870, Miss. Scien. Mex., vol. 3, Reptiles, p. 140.—COPE, 1871, Proc. Acad. Nat. Sci. Philadelphia, p. 216.—GARMAN, 1884, Bull. Essex Institute, vol. 16, p. 19.—

<sup>21</sup>Nelson, E. W., Chief of the U. S. Bureau of Biological Survey, supplied his field notes on this genus.



COPE, 1885, Proc. Amer. Philos. Soc., vol. 22, pp. 379-388.

*Ctenosaura pectinata* GRAY, 1845, Cat. Lizards Brit. Mus., pp. 191.—SUMICHRAST, 1880, Bull. Soc. Zool. France, vol. 5, p. 174.

*Ctenosaura acanthura* BOULENGER, 1885, (Part) Cat. Lizards Brit. Mus., vol. 2, p. 197.—GÜNTHER, 1890, Biol. Cent. Amer., pp. 56-57, pl. 30.

*Type*.—Berlin Museum No. 574, male.

*Type locality*.—Restricted to Colima, Colima, Mexico.

*Diagnosis*.—This species is very near *Ct. brevirostris*, *similis* and *parkeri*, having in common with them the dorsal crest extending to the base of the tail, uninterrupted in the sacral region, but differing from each of them in one or more important characters. From *brevirostris* it differs in the length of the rostrum or muzzle; the rostrum of *brevirostris* being short and decurved while in *pectinata* it is elongate and not decurved in a pronounced manner. The arrangements of the caudal scales in *pectinata* and *brevirostris* are essentially the same; the first five whorls of spinous scales being separated from each other by three rows of small flat scales; the remaining whorls being separated by two rows of small scales for a short distance, then by one row which gradually becomes spinous and similar to the other caudal scales. But in *similis* only the first and second (and occasionally the third) whorls of spinous scales are separated from each other by three rows of small flat scales, the subsequent whorls of spinous scales being separated by two rows of flat scales up to about the middle of the length of the tail, then by one row of flat scales which gradually become spinous and similar to the other caudal scales just as in the other related species. In *parkeri* the first seven whorls of spinous scales are separated from each other by four rows of smaller flat scales.

*Distribution*.—*Ctenosaura pectinata* occurs on the west coast of Mexico from the State of Nayarit southward to Oaxaca. Collections have been made at San Blas, Maria Madre Islands, and Isabel Island, Nayarit; Colima City, and Mount Colima, Colima; Balsas and Acapulco, Guerrero; and San Geronimo, Oaxaca.

*Description*.—Berlin, type, No. 574, adult male; M.C.Z. 2726, adult male and female; 6982, adult female; A.M.N.H. 119, adult female. Head elongate, flat above, covered with small hexagonal scales very distinctly marked off from body. Scales on muzzle smooth and somewhat larger than other head scales; supraoculars small, flattened, and hexagonal, externals being only about one-half as large as internals and separated from each other by a row of four scales. Ear opening almost as large as orbit; no dewlap, but a pronounced transverse gular fold present; nostrils large, very near tip of snout, almost tubular, opening obliquely backward; lores flat; supralabials,

12; sublabials, 14. Dorsal scales small, hardly more than half the size of ventrals, gradually increasing in size posteriorly, smooth; a well-developed dorsal crest composed of from 63 to 75 carinated scales extending from insertion of neck caudad to base of tail, being continuous over sacral region as true carinated scales, but much reduced in height. In old males these dorsal spines reach a height of 10 mm. Leg scales without spines. Femoral pores vary from 5-5 to 7-7. Toes very long, especially those of hind feet; claws strong and sharp. Tail nearly cylindrical, scales on upper side being of two kinds, large and spinous, and small, low, flat scales arranged in whorls. Median dorsal scales are large and heavily armed throughout length of tail. The others are arranged in whorls; some whorls are spinous and some are flat and smooth. First 5 whorls of large spinous scales separated from each other by 3 rows of small flat scales; next 9 or 10 whorls of large spinous scales separated from each other by 2 rows of small flat scales, while on terminal three-fifths of tail all of scales gradually become equally spinous. At base of tail ventral scales are smaller than dorsals, four rows of ventrals corresponding to three above, slightly keeled and pointed posteriorly.

*Measurements.*—

	Berlin Museum, type No. 574 M.	M.C.Z.M. No. 2726	M.C.Z.F. No. 6982
	<i>Mm.</i>	<i>Mm.</i>	<i>Mm.</i>
Length of head.....	65	85	70
Length of body.....	205	220	210
Length of tail.....	<sup>1</sup> 405	<sup>1</sup> 180	455
Total length.....	<sup>1</sup> 660	<sup>1</sup> 485	735
Breadth of head over orbits.....	28	32	30

<sup>1</sup> Tail broken off.

*Coloration.*—General body color is brown-olivaceous streaked with yellow. Dorsal spines are yellow wherever the yellow markings cross the mid-back. Upper portion of head is brown, lores yellowish. Except for two small transverse brown bands the lower maxillae is yellowish. Neck brown, with rather long yellow bar running caudad from posterior margin of tympanum, vanishing slightly caudad and above axilla of arm. Abdomen yellowish olive girdled by three brown (sometimes broken) bands. Breast brown; limbs brown with yellow marks and spots. Tail ringed with alternate, wide bands of brown and yellow.

*Remarks.*—Wiegmann described this species from a male specimen collected by F. Deppe in "Mexico." Many specimens, ranging in age and size from very young to adults, including both sexes, have been examined and found to agree with the type in all essential characteristics.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
Berlin:						
574	M.	Adult	Mexico		F. Deppe	Type.
A.M.N.H.:						
119	F.	do	Colima, Mexico	1901	L. Digue	
120	M.	do	do	1901	do	
123	M.	do	Mount Colima, Mexico	1901	do	
U.S.N.M.:						
24627	F.	Young	Maria Madre Island, Nayarit, Mexico	May 15, 1897	E. W. Nelson	
24633	F.	Half grown	Isabel Island, Nayarit, Mexico	May, 1897	do	
47729		Young	Prextla, Puebla, Mexico	1894	Nelson and Goldman	
47919	M.		Rio Balsas, Guerrero, Mexico	June 4, 1903	do	
47920	F.		do	do	do	
51402	F.	Young	Tepic, Nayarit, Mexico	Dec. 26, 1913	J. C. Thompson	
51403	F.	do	San Blas, Nayarit, Mexico	Dec. 20, 1913	do	
51404	M.	do	do	do	do	
51405	F.	do	do	do	do	
51406	F.	do	do	do	do	
72555-6	M.	do	Tres Marias, Nayarit, Mexico	1885	A. Forrer	2 specimens.
72657	F.	do	do	1885	do	
M. C. Z.:						
1135-7	M. & F.	Half grown	Colima, Mexico	1914	G. Gluckert	8 specimens.
2040			Acapulco, Guerrero, Mexico	1872	L. Agassiz	Hassler expedition.
2726	F.	Adult	do	1874	Dr. F. Heideckheim	2 specimens.
2726	M.	do	do	1874	do	Do.
6982	F.	do	San Geronimo, Oaxaca, Mexico	1902	(?)	

## CTENOSAURA BREVIROSTRIS (Cope)

## Plates 12, 13, 15

*Ctenosaura brevirostris* COPE, 1886, Proc. Amer. Philos. Soc., vol. 23, pp. 266-268; 1887, Bull. 32, U. S. Nat. Mus., p. 34; 1900, Rep. U. S. Nat. Mus. for 1898, p. 238.

*Ctenosaura acanthura* GÜNTHER, 1890, Biol. Cent. Amer., Rept. Batr., p. 57, (Part).

*Type*.—Cat. No. 24709, U.S.N.M., male.

*Type locality*.—Colima, Colima, Mexico, John Xantus, collector.

*Diagnosis*.—This species is very similar to *Ct. pectinata*, but may be distinguished from it by the very short head with an obtuse muzzle, exhibiting a pronounced decurved profile.

*Distribution*.—This species occurs on the Pacific foothills of the mountain ranges from Jalisco southward to Oaxaca. The type was taken at Colima City; others have been taken at San Marcos, Jalisco; Manzanillo, Colima; Sierra Madre, Michoacan; and Guichicovi, Oaxaca. Over 90 specimens were collected at Colima by John Xantus.

*Description*.—U.S.N.M. Nos. 24708, adult female; 24709, half grown male cotype; 47933, adult male. The following description is from Cope's original, with modifications according to the writer's observations of the types.

Head very short with obtuse muzzle, with pronounced decurved profile. Eyes large, nostril near end of muzzle, in anterior third of distance between end of muzzle and orbit. Scales on top of muzzle and of frontal region subquadrate or subhexagonal, those of temporal regions but little longer than wide. All are more or less convex, temporals more so; rostral plate larger than mental. Six rows of scales between nasal plates, some of which are wider than long. Three canthal scales, of which the anterior is horizontally divided in one specimen. Four rows of wide loreal scales above four rows of narrow scales above the supralabials. Supralabials, 11-12; sublabials, 14-15; loreals flat. Scales on muzzle larger than parietals; supraorbitals smaller than other head scales and separated from each other by four rows of scales. Dorsal scales small, hardly more than half size of ventrals, gradually increasing in size posteriorly, smooth. Dorsal crest composed of from 75 to 80 carinated scales, beginning just back of head, on neck, and continuing uninterrupted at sacrum, to base of tail. Crest over the sacrum is very low, but is present as raised carinated scales, thereby maintaining median row of raised dorsal spines or crest. In female specimens entire crest is much lower than that of male; those of adult males reaching a height of 5 to 8 mm. Limbs are without heavy spinous scales. Tail is nearly cylindrical, scales on upper side being of two kinds; large spinous scales and small, low, flat scales, arranged in whorls. Median dorsal scales are large and heavily armed throughout length of tail; others are arranged in whorls; some whorls spinous and some flat. In one specimen the first 5 whorls of large spinous scales are separated from each other by 3 rows of small, flat scales; next 9 or 10 whorls of large spinous scales by 2 rows of small, flat scales; while on the terminal three-fifths of tail all of the scales gradually become equally spinous. At base of tail ventral scales are smaller, four rows corresponding to three above, slightly keeled and pointed posteriorly. Toes very long, especially those of hind feet; claws strong and sharp.

In both specimens femoral pores are small, exceedingly so in female, which has six pores on each femur. Male has five pores on each femur. Both have distinct transverse gular fold.

*Measurements.*—

	Type U.S.N.M. F., No. 24708	Cotype U.S.N.M. M., No. 24709	U.S.N.M. M., No. 47933
	<i>Mm.</i>	<i>Mm.</i>	<i>Mm.</i>
Length of head.....	45	40	55
Length of body.....	197	150	195
Length of tail.....	1403	420	520
Total length.....	1645	610	775
Width of head over orbits.....	30	25	33

<sup>1</sup> Part of tail broken off.

*Coloration.*—General color of head and body blackish brown, being crossed on back between sacral and postscapular regions by five yellow, marks, which are bands posteriorly but become spots anteriorly. These bands are more pronounced in females. Sides of neck yellow, contrasting strongly with black of throat and nape. This yellow space is practically divided by a black line, which extends posteriorly from angle of lower jaw. Under parts are yellowish, streaked slightly with waves of blackish-brown spots; a yellow stripe beginning at posterior border of tympanum extends caudad over shoulder, fading out slightly above and caudad to axilla of arm. Limbs are blackish, and on fore arms are numerous yellow scales; digits and tail are annulated with blackish-brown and yellow rings of about equal width.

*Remarks.*—This species has approximately the same distribution as *Ctenosaura pectinata* and on account of the great similarity to it may be mistaken for it. Both species frequent trees, but are more often seen scurrying about on the ground and among the rocks. The chief difference between the two species is to be found in the structure of the head. In *brevirostris* the head is very short and the muzzle is pronouncedly decurved, while in *pectinata* the head is long and the muzzle only slightly decurved.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
U.S.N.M.:						
12196		Young	Colima, Mexico.	July 1, 1865.	J. Xantus	2 specimens.
12230	M.	do	Sierra Madre Michoacan, Mexico.	(?)	(?)	
18968	F.	Adult	San Marcos, Jalisco, Mexico.	Mar. 26, 1892.	P. L. Jouy	
18969	F.	do	do	Mar. 30, 1892.	do	
24708	F.	do	Colima, Mexico.	(?)	J. Xantus	Cotype.
24709	M.	Half grown	do	(?)	do	
24710-9		Young	do	(?)	do	10 specimens.
24720-3	M.	do	do	(?)	do	4 specimens.
24726	F.	Half grown	do	(?)	do	
31484	F.	Young	do	(?)	do	
47933	M.	Adult	Guichicovi, Oaxaca, Mexico.	June 26, 1895.	Nelson and Goldman	
58670	F.	Half grown	Colima, Mexico.	July, 1902.	J. Hurter	
63701	M.	Young	Manzanillo, Colima, Mexico.	February, 1863	J. Xantus	
63702-31	{ M. & F. }	do	Colima, Mexico.	(?)	do	30 specimens.
63732	M.	do	Tonalá, Colima, Mexico.	(?)	do	2 specimens.
63733	M.	do	do	(?)	do	
63734-68	{ M. & F. }	do	Colima, Mexico.	July, 1863.	do	35 specimens.

CTENOSAURA PARKERI, new species

Plates 14, 15

*Type.*—Cat. No. 18967, U.S.N.M., adult female, Barranca Ibarra, Jalisco, Mexico. April 22, 1892, P. L. Jouy.

*Paratypes.*—Cat. No. 18970, U.S.N.M., a half-grown female having same data; Brit. Mus. No. 1, adult male; No. 75, half-grown male;

No. 76, adult female. From Tres Marias, Nayarit, Mexico, by M. Forrer.

*Diagnosis.*—Dorsal crest very pronounced, not interrupted at sacrum, the continuity being effected by short lobes or depressed but enlarged scales. Tail ringed on upper half with whorls of strong and very spinous scales. First six whorls of spinous scales are separated from each other by four rows of smaller flat scales; the next three by three distinct rows and a partial fourth which borders the median dorsal spines of the tail. Subsequent whorls up to half the length of the tail are separated from each other by two rows of small scales. Distal half of tail appears spinose throughout, the smaller scales becoming larger and gradually pass into the spinous type. A comparison of this species with its most nearly related species is given under *Ct. pectinata*.

*Distribution.*—This species is known only from Barranca Ibarra, Jalisco, and Tres Marias, Nayarit.

*Description.*—U.S.N.M. Nos. 18967, adult female type; 18970, half-grown female paratype; Brit. Mus. Nat. Hist. Nos. 1, adult male; 75, adult male; 76, adult female, paratypes. Head long and narrow, covered with small hexagonal scales and very distinctly marked off from the body. Transverse gular fold present; no dewlap. Scales on muzzle larger than other head scales. Nostrils large, situated in the anterior third of the distance between orbit and tip of muzzle; nostral equal in width to mental, and deeper; lores flat, supralabials, 12; sublabials, 13. The back and sides are covered with small, smooth, subquadrate scales which pass gradually into larger ventrals. Gular region covered with small, smooth scales which become larger posteriorly. Smallest gulars as large as largest dorsals, but smaller than the ventrals. Scales on limbs without spines. Tympanum nearly as large as orbit. Supraoculars small, flat, and hexagonal, the externals being about one-half as large as the internals, the internals being separated from each other by four rows of scales. The dorsal crest begins immediately back of the head and is composed of 73 compressed lobes, being continuous with the caudal crest and not interrupted at the sacral region. The lobes are highest (7 mm.) on the nape, and gradually diminish in height posteriorly until on the sacral region, where they appear merely as enlarged keeled scales. Their size and position makes them conspicuous even in the sacral region. The dorsal crest is much higher in males than in females. The tail is ringed about on the upper half with whorls of strong and very spinous scales. These whorls of spinous scales are separated from each other by rows of smaller, flat scales, the first six by four distinct rows of small scales, the sixth, seventh, and eighth by three distinct rows and a partial

fourth row bordering on the row of median caudal spines; the subsequent whorls of spinous scales, up to half the length of the tail, are separated from each other by two rows of small scales. The distal half of the tail appears spinous throughout, the smaller scales becoming larger and gradually pass into the spinous type. The median caudal spines appear to be "set into" the other scales, so to speak; the margins of the adjacent scales lapping over the edges of the median row. The toes are very long, especially those of the hind feet; the claws are long and sharp. Femoral pores, right side 6, left side 5.

*Measurements.*—

	U.S.N.M. F., type No. 18967	U.S.N.M. F., para- type No. 18970
	<i>Mm.</i>	<i>Mm.</i>
Length of head.....	65	40
Length of body.....	225	155
Length of tail.....	520	330
Total length.....	810	525
Width of head over orbits.....	35	23

*Coloration.*—The general color of this species is olive green, lightly washed with vermilion and reticulated with brown and black. The flanks are heavily washed with vermilion. There are eight black blotches on the vertebral line, separated by areas paler than the general tint. All of the blotched markings are small and are more pronounced on the lobes making up the dorsal crest. Laterally they are represented by small blackish brown spots, but as they encircle the body they become conspicuous black bands. The transverse gular fold is heavily marked with black. There is a conspicuous black blotch bordering on the dorso-caudal margin of the tympanum. The tail is ringed with alternate wide bands of brown and yellow.

*Remarks.*—A half-grown female, Cat. No. 18970, U.S.N.M. (same data as above), agrees with the type in all specific characters, but varies slightly in one or two minor details. The first and second whorls of spinous scales on the tail are separated from each other by four rows of small flat scales; the second, third, and fourth by five rows; the fourth, fifth, and sixth by four rows; the sixth, seventh, and eighth by three well-defined rows and a partial fourth row; the eighth, ninth, and tenth by three distinct rows; the remainder of the tail exactly as the type. The femoral pores as 7-7. Dorsal spines 75.

Three specimens in the British Museum of Natural History, labeled from Tres Marias, Nayarit, vary slightly in the precise number and arrangement of the caudal scales, but agree with the type in all specific characters. They are designated as paratypes.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
U.S.N.M.: 18967.....	F.	Adult.....	Barranca Ibarra..	Apr. 22, 1892	P. L. Jouy .....	Type.
18970.....	F.	Half grown	Jalisco, Mexico..	.....do.....	.....do.....	Paratype.
Brit. Mus.: 1.....	M.	Adult.....	Tres Marias, Nay- arit, Mexico.	.....do.....	M. Forrer.....	Do.
75.....	M.	Half grown	.....do.....	.....do.....	.....do.....	Do.
76.....	F.	Adult.....	.....do.....	.....do.....	.....do.....	Do.

## CTENOSAURA SIMILIS (Gray)

Plates 16, 17, 18, 19, 20

*Iguana (Ctenosaura) similis* GRAY, 1831, Griff. Cuv. Animal Kingdom, vol. 9, Synopsis, p. 38.

*Cyclura (Ctenosaura) similis* WIEGMANN, 1834, Herpet. Mex., p. 42.—FITZINGER, 1843, Syst. Rept., p. 56.

*Ctenosaura completa* BOCOURT, 1874, Miss. Sci. Mex., vol. 3, Reptiles, p. 145.—COPE, 1886, Proc. Amer. Philos. Soc., vol. 23, pp. 266–269.—GÜNTHER, 1890, Biol. Cent. Amer., Rept. Batr., p. 58, pl. 29.—COPE, 1900, Rept. U. S. Nat. Mus. for 1898, p. 238.—BARBOUR, 1921, Proc. New Engl. Zool. Club, vol. 7, p. 82.

*Ctenosaura acanthura* BOULENGER, 1885 (Part Group C), Cat. Lizards Brit. Mus., vol. 2, 197.

*Type.*—Museum of Mr. Bell, London, England.

*Type locality.*—Restricted to Tela, Honduras, Central America.

*Diagnosis.*—Dorsal crest very pronounced, not interrupted at sacrum, the continuity being effected by short lobes in adult male and by compressed scales in females and young. Tail ringed about on upper half with strong and very spinous scales, the first and second (and occasionally the third) of these half rings are separated from each other by three rows of small flat basal scales; subsequent whorls of spinous scales up to the first third of tail's length by two such rows of small scales; from this point the spinous scales continue without interruption to distal end of tail. Body color chrome tint, with trunk striped by five bands joining over stomach and united by numerous spots of same color. In *Ct. pectinata*, with which this species is sometimes confused, the first five whorls of spinous scales on the tail are separated from each other by three rows of small flat scales.

*Distribution.*—This species occupies the lowlands of Central America and southern Mexico, and the sandy beaches of Panama. In Mexico it occurs on the Isthmus of Tehuantepec and the Yucatan Peninsula. The type at the time the description was published was in the personal museum of a Mr. Bell of London, but its present whereabouts is unknown. Also the types of *Ctenosaura completa*, a synonym of *similis*, collected by Bocourt in 1872, bear no definite



locality label. They are said to have been collected in "Salvador and Guatemala." Such general records are of no real value. Consequently I hereby restrict the type locality of *similis* to Tela, Honduras, where the greater number of specimens of this species have been taken. It also has been collected at the following places: In Central America—Belize and Glovers Reef, British Honduras; Amapala, Patuca, and San Pedro Sula, Honduras; Panama City, Corozal, and San Miguel Island, Panama; Trives, Bonilla, Oritina, and Esparta, Costa Rica; Corinto, Chinadega, Polvon, Matagalpa, and Coseguina Volcano, Gulf of Fonseca, Nicaragua; Republic of Salvador; Old Providence Island, off Nicaragua; Bocomon, Cuastotoya, and Hacienda California, Guatemala. In Mexico—Progreso, La Vega, Merida, Chichen Itza, Mujeres Island, and Cozumel Island, Yucatan; Puerto Morelos, Quintana Roo Territory; Chiapas, Tonala, Montecrista, Tabasco, Tehuantepec, Oaxaca, and Suchitepequez on the Los Patos River (14 miles from its mouth).

The specimen from Old Providence is a small female, not more than one-fourth grown. It is a true *similis* and was in all probability carried to the island from the neighboring mainland by some fishing or turtling schooner.

*Description.*—Paris Nos. 01-255, adult male; 2252, adult male, type. M.C.Z. No. 22624, adult female; 22088, adult male; 22625, adult male. U.S.N.M. 56782, adult male; 47565, adult female. Head long, triangular, covered with small hexagonal slightly convex scales and very distinctly marked off from the body. Muzzle narrowed; supra oculars small, being separated from each other by four or five rows of scales; ear opening is almost as large as orbit. No dewlap, but the transverse gular fold is very pronounced; parietal scales slightly smaller than those on muzzle; nostrils large, situated in anterior third of distance between orbit and tip of muzzle; rostral larger than mental; lores flat; 13-14 enlarged supralabials; 13-14 enlarged sublabials; dorsal scales much smaller than ventrals, gradually increasing posteriorly in size, and spinousness; well-developed dorsal crest composed of from 60 to 92 spinous scales, constricted and pointing slightly backward. Prominent dorsal scales begin just back of head, on neck, and continue uninterrupted to base of tail; the continuity of this crest is effected by short lobes in the sacral region of adult males and by compressed scales in females and young. Tail is ringed about on upper half with whorls of strong and very spinous scales, the first and second (and occasionally the third) of these whorls of spinous scales being separated from each other by three rows of small flat basal scales; the subsequent whorls of spinous scales up to the first third of the tail's length by two

such rows of small scales; from this point the spinous scales continue without interruption to the distal end of tail. At base of tail ventral scales are much smaller than dorsals, three rows corresponding to each pair above, slightly keeled and pointed posteriorly. After the first four or five rows, ventrals and dorsals approach each other in size, two rows of ventrals corresponding to a like number of dorsals. Toes very long, especially those of hind feet; claws long and sharp; femoral pores 5-5 to 9-9; tibia without spiny scales.

*Measurements.*—

	01-255, Paris, M.	2252 type, Paris, M.	22088, M.C. Z., M.	56782, U.S. N.M., M.	47565, U.S. N.M., F.
	<i>Mm.</i>	<i>Mm.</i>	<i>Mm.</i>	<i>Mm.</i>	<i>Mm.</i>
Length of head.....	95	70	85	100	60
Length of body.....	225	205	220	240	190
Length of tail.....	<sup>1</sup> 330	455	470	580	<sup>1</sup> 410
Total length.....	<sup>1</sup> 730	<sup>1</sup> 710	775	920	<sup>1</sup> 660
Width of head over orbits.....	37	31	35	38	28

<sup>1</sup> Tail broken off.

Paris No. 2252 is a cotype of *Ctenosaura completa* Bocourt (*Ct. similis*).

*Coloration.*—General body color chrome tint, trunk being striped by four or five black bands joining over stomach and united above by numerous spots of the same color. In old specimens the back bands become somewhat narrower and more or less broken up, appearing on the middorsal region of back as two distinct bands. Dorsal crest spines that lie in path of these bands are also colored black. Limbs blackish. Transverse gular fold spotted with black; throat and chin tinted with dark gray. Tail ringed with alternate wide bands of brown and yellow. In the younger specimens the general body color is light olive green, the inferior regions being yellowish, spotted with small brown or blackish dots.

*Remarks.*—These lizards are very common in Central America, the Peninsula of Yucatan, and the Isthmus of Tehuantepec, Mexico. They are most abundant in the lowlands on the sandy flats and beaches. Their chief food consists of tender buds. They also feed on insects, as revealed by the examination of 25 stomachs. Most of the insects were beetles and grasshoppers. In Panama the habits of this species differ slightly from those of the same species farther north. They occur on both sides of the Isthmus wherever there are sandy beaches, preferably with outcroppings of rock. They never appear about muddy shores or mangroves. These habitat associations occur more widely on the dry Pacific than on the moist Atlantic side. Even in the dry Panama areas of the Pacific side one rarely sees this species more than 200 yards from the beach. They like the sand banks and rock piles

and will lie basking in the hot sunshine. When discovered they scamper away among the rocks, but never take refuge among the shrubs, bushes, or low trees as does the same species farther northward. They are common about the old sea wall at Old Panama, about the rip rap falls near La Boca, at the Pacific entrance to the canal, and at Punta Bruja, a few miles to the westward. This species is never quite as numerous in Panama as just back of the beach at Tela, Honduras, where many may be seen at almost any time. Here they may be caught by the dozens in steel traps baited with a hibiscus flower.

J. E. Gray described *Ctenosaura similis* from a dried skin belonging to a Mr. Bell of London.<sup>22</sup> The description, which was published in 1831, is given here "in toto":

Allied Iguana, *Iguana (Ctenosaura) similis*.

Grey, black dotted, body with four oblique dark bands; occiput forming a concave band behind; dorsal crest low but continued over the sacrum. Teeth blunt, three lobed; palatines on two raised lines on each side. Head 2 body 9 inches. Mus. Bell.

This type, a mounted skin, was formerly in the private museum of a Mr. Bell of London, but subsequently disappeared. A careful search among the specimens and records at the British Museum fail to give any clue as to its whereabouts.

Weigmann,<sup>23</sup> in 1834, and Fitzinger,<sup>24</sup> in 1843, listed this species as *Cyclura similis*. They did not see the specimen but merely adopted Gray's specific name of *similis*.

Bocourt,<sup>25</sup> in 1874, described this species as *Ctenosaura completa* from two adult male specimens and three young collected in "Guatemala and Salvador," by himself in 1872.

The next mention of *similis* and *completa* was by Boulenger,<sup>26</sup> in 1885, at which time he listed both, along with many others, as synonyms of *Ctenosaura acanthura*. From that time on *similis* has been overlooked entirely, but its synonym, *completa*, was recognized as a distinct species by Cope<sup>27</sup> in 1886, and since then has enjoyed that distinction, being mentioned as such as recently as 1921 by Barbour.<sup>28</sup>

It is indeed unfortunate that this oversight has existed for so long a time, and I take this opportunity to restore the original name of *Ctenosaura similis* to this species.

<sup>22</sup> Gray, Grif. Cuv. Animal Kingdom, vol. 9, Synopsis p. 38, 1831.

<sup>23</sup> Weigmann, Herpt. Mex., p. 42, 1831.

<sup>24</sup> Fitzinger, Syst. Rept., p. 56, 1843.

<sup>25</sup> Bocourt, Miss. Sci. Mex., vol. 3, Reptiles, p. 145, 1874.

<sup>26</sup> Boulenger, Cat. Lizards Brit. Mus., vol. 2, p. 197, 1885.

<sup>27</sup> Cope, Proc. Amer. Philos. Soc., vol. 23, pp. 265-269, 1886.

<sup>28</sup> Barbour, Proc. New Eng. Zool. Club, vol. 8, p. 82, 1921.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
Brit. Mus.:						
1	M.	Adult	Colon (?) Panama.	(?)	M. Bocourt	
2	M.	do	do	(?)	do	
21	M.	do	Pacific coast, Costa Rica.	1909	Balleña	
44	F.	Halfgrown.	Mujeres Island, Mexico.	1889	S. F. Gaumer	
45	F.	do	do	1889	do	
(?)	M.	Adult	"S. Mexico"	1889	F. D. Goodman	
Paris:						
2251	M.	Young	Salvador	1872	Bocourt	} Cotypes of <i>Ct. completa</i> .
2252	M.	Adult	do	1872	do	
8221	M.	do	Mexico	(?)	A. Schott	
11002	F.	do	do	(?)	(?)	
01-255	M.	do	do	1901	Dignet	
Hamburg Mus.:						
2408			Nicaragua	1895	Keasenberg	
2792			Corinto, Nicaragua.	1901	Tausen	
3546			Amapala, Honduras.	1910	Pressler	
3547			Corinto, Nicaragua.	1910	do	
3550			Nicaragua	1910	do	
4204			Corinto, Nicaragua.	1912	do	
4205			Salvador	1912	do	
A. M. N. H.:						
118	M.	Adult	Yucatan	1896	F. M. Chapman	
16398	F.	Halfgrown.	Nicaragua	1916	Nicaragua expedition.	
16401	F.	do	do	1916	do	
Cal. A. S.:						
1097	F.	do	Cuatotoya, Jalapa, Guatemala.	(?)	(?)	
3849	F.	Young	Suchetepquez, Guatemala.	(?)	(?)	
49149	M.	Adult	Coseguina, Nicaragua.	1919	J. R. Slevin	Very large.
M. C. Z.:						
3810	F.	Young	Palvon, Nicaragua.	1876	Nicheil	
5457	{ M. & F. }	Adult and young.	do	1886	do	5 specimens.
5799	F.	Halfgrown.	Corcuera, Nicaragua.	1886	do	3 specimens.
6270	M.	Young	Merida, Yucatan.	1889	E. W. Thompson.	2 specimens.
7123	M.	do	Progreso, Yucatan.	1905	L. J. Cole.	
9524	F.	do	Chinadega, Nicaragua.	1905	W. B. Riebardson.	
9566	F.	Adult	Metagalpa, Nicaragua.	1908	do	
10308-12	F.	Halfgrown.	San Miguel Island, Panama.	1904	W. W. Brown	5 specimens.
10313	F.	do	Panama City, Panama.	1904	do	
15354-55	M.	Young	Orotina, Costa Rica.	1920	E. R. Dunn	2 specimens.
19274-8	F.	do	Esparta, Costa Rica.	1922	C. T. Underwood.	5 specimens.
21101-15	{ M. & F. }	Adult and young.	Tela, Honduras	1925	Dr. H. C. Clark.	15 specimens.
21743-52	{ M. & F. }	do	do	1925	do	10 specimens.
22088	M.	Adult	Glovers Reef, British Honduras.	1925	L. L. Mowbray.	Very large.
22624	F.	do	Tela, Honduras	1927	T. Harbour	
22625	M.	do	do	1927	do	
No number.	{ M. & F. }	Adult and young.	do	1925	Dr. H. C. Clark.	7 specimens.
No number.		Young.	Hacienda California, Guatemala.	1926	A. W. Anthony.	2 specimens.

*Material examined.*—Conti ued

Specimen	Sex	Age	Locality	Date	Collector	Remarks
U.S.N.M. 5807			Aspinwall, Panama.		Prof. Gill.	
11002			Mexico.			Exchange Paris Museum.
11003	M.	Adult	"Mexico"	1872.	Bocourt	Paratype <i>Ct. completa</i> .
11018	F.	Young	Nicaragua		Dr. J. A. Bransford.	
13867			Cozumel Island, Yucatan, Mexico.	Jan. 23, 1885.	Albatross expedition.	
13876	F.	Half grown.	West Indies, Old Providence.	1884.	do	
13898	M.	Adult	Cozumel Island, Yucatan, Mexico.	Jan. 1, 1885.	do	
17799-03	M.	Half grown.	Honduras	1911	C. H. Townsend.	6 specimens.
20290-6	M.	Young	Patuca, Honduras	1891	H. W. Perry	7 specimens.
24375-6	M.	do	San Pedro Sula, Honduras.	(?)	J. C. Ingersoll	2 specimens
24724			Yucatan, Mexico.		A. Schott	
24725	M.	Half grown.	do		do	
24898	M.	do	do		do	
24911	M.	Young	Belize, Honduras	(?)	(?)	
26071	M.	do	do	(?)	W. H. Stanton	
32114	F.	Half grown.	"Central America."	(?)	(?)	
35723	M.	do	Bonillas, Costa Rica.	(?)	R. Ridgeway	
37062		Young	Tirives, Costa Rica.	Apr. 12, 1906.	A. Alfora	
37003		do	do	do	do	
46685	F.	do	Tonalla, Chiapas, Mexico.	Aug. 9, 1895.	Nelson and Goldman.	
46693	F.	do	do	do	do	
47559-62	M.	Adult	Nujeres Island, Yucatan, Mexico.	Mar. 25, 1901	do	
47563	M.	Young	do	do	do	
47564	M.	do	La Vega, Yucatan, Mexico.	Mar. 15, 1901	do	
47565	F.	Adult	Cozumel Island, Yucatan, Mexico.	Apr. 11, 1901	do	
47593	M.	Young	Palanque, Chiapas, Mexico.	May 25, 1900	do	
47647	M.	do	Puerto Morelos, Quintana Roo Territory, Mexico.	Mar. 28, 1901	do	
47793	M.	Adult	Monte Cristo, Tabasco, Mexico.	May 7, 1900	do	
47794	M.	Young	Chichen Itza, Yucatan, Mexico.	February, 1901.	do	
47802	F.	Half grown.	Monte Cristo, Tabasco, Mexico.	May 7, 1900	do	
47953-5	M.	Adult	Chichen Itza, Yucatan, Mexico.	Feb. 10, 1901	do	3 specimens.
54204	M.	Half grown.	Corozal, Canal Zone.	Apr. 11, 1911	Meeks and Hilderbrand.	
56780	M.	Adult	Belize, British Honduras.	May 26, 1914.	J. Hurter	
56781	M.	Half grown.	do	do	do	
56782	M.	Adult	Tehuantepec, Oaxaca, Mexico.	1905	do	
58499	M.	Young	do	1905	do	
58500	M.	Adult	Chinadega, Nicaragua.	1901	do	
71375-7	{ M. & F. }	do	Bocomon, Peten, Guatemala.	(?)	Harry Malleis	Do

## CTENOSAURA BAKERI Stejneger

Plates 21, 22

*Ctenosaura bakeri* STEJNEGER, 1901, Proc. U. S. Nat. Mus., vol. 23, pp. 467-468.

*Type*.—Cat. No. 26317. U.S.N.M., male.

*Type locality*.—Utila Island, Honduras, 1900; Dr. J. E. Jarnigan, collector.

*Diagnosis*.—A noticeable dewlap hanging from posterior part of throat; caudal whorls of spines separated by two rows and one row of flat scales. Dorsal crest high over neck and shoulders and gradually becoming shorter caudad, not continuous with caudal crest; upper sides of tibia with somewhat enlarged keeled scales; spines of median caudal crest subequal, much longer than the other caudal spines.

*Distribution*.—This species is confined to Utila Island, Honduras. This island is only 7 miles long and is situated just off the north coast of Honduras, in the Caribbean Sea. It is located within the 100-fathom line of the mainland. It may occur on Bonacca and Ruatan Island also.

*Description*.—Cat. Nos. 26317, U.S.N.M., adult female, type; 25324, adult female paratype. Head normal in length, covered with small hexagonal scales having slightly decurved muzzle. Head scales slightly rugose in adults. Supraoculars small, being separated from each other by four rows of scales; parietal scales smaller than those on top of muzzle; nostrils large, much nearer tip of snout than orbit, almost tubular, opening obliquely backward; rostral larger than mental; lores flat; 10-12 enlarged supralabials; 9-11 enlarged sublabials; ear opening as large or almost as large as orbit; dorsal scales small and smooth, hardly more than half the size of ventral scales, being almost granular on neck and gradually increasing in size posteriorly; dorsal crest well developed over neck and shoulders, the spines gradually diminishing in size posteriorly until at sacrum they become lost, the dorsal crest not being continuous with caudal crest. Spines and scales of dorsal crest 45 to 50 in number, beginning immediately behind head, the first scale is smallest, while the crest is highest over neck and shoulders, gradually diminishing in size posteriorly, until over small of back (loins) it consists merely of a median dorsal row of enlarged and slightly carinated scales. The spines are very compressed. Maximum height of dorsal crest scales is 3.5 mm., maximum width 2.5 mm. They are falcate in shape; their base is very flexible. A fairly large compressed dewlap hangs from posterior part of throat, 10 mm. from middle of base to top, the base along middle of throat being about 30 mm.; scales on throat and dewlap smaller than ventral scales, all smooth; scales of fore limbs normal; those of hind limbs larger, some of those of femur and tibia enlarged and slightly spiniferous. Femoral pores 9-9; tail not constricted at insertion; caudal scales above and laterally in whorls of large spinous scales,

the central ones being spinous and equal or nearly so throughout length of tail; lateral spines are much less developed, being in fact smaller than median series and being separated by rows of smaller flat scales; first, second, and third whorls of spiniferous scales separated by two rows of these small flat scales; third, fourth, fifth, sixth, and seventh by one row of flat scales, and the other whorls of spiniferous scales by two rows of flat scales; caudal ventral scales smaller than dorsals, three rows corresponding to each pair above, strongly keeled and pointed posteriorly.

*Measurements.*—

U.S.N.M., No. 25324,  
adult F., paratype

Length of head.....	50 mm.
Length of body.....	160 mm.
Length of tail.....	265 mm.
Total length.....	475 mm.
Width of head over orbits.....	26 mm.

*Coloration.*—Alcoholic specimen, paratype, Cat. No. 25324, U.S.N.M. Dusky brown showing signs of green with yellow variations on neck, throat, dewlap, and abdomen; dorsal crest and back dark brown with occasional outcroppings of yellow or green.

*Remarks.*—This species in possessing a very noticeable dewlap shows a close relationship to *Ctenosaura palearis*, from Gualan, Guatemala, and because of this striking peculiarity needs no comparison with other species of the genus. From *palearis*, however, this species differs in the less marked differentiation of the enlarged tibial scales and in the scutellation of the tail. In *bakeri* the first, second, and third whorls of spiniferous scales are separated by two rows of smaller flat scales; the third, fourth, fifth, sixth, and seventh by one row of flat scales, and the others by two rows, while in *palearis* there is only one row of very small flat basal scales throughout. In *palearis*, the median dorsal crest consists of alternate large and small spines, while in *bakeri* the spines of the crest are equal or nearly so. In *palearis* the lateral spines on the tail are better developed than are the median series, while in *bakeri* the scales of the median series are the largest. Then, too, *bakeri* grows to be larger than *palearis*, even more so than comparative total length measurements indicate. The head and body of *bakeri* are very much heavier than that of *palearis*, but the tail is somewhat shorter.

The dewlap of *bakeri* is not as large as in *palearis*. This character, along with the peculiar scutellation of the tail in *bakeri*, tends somewhat to fill the gap between *palearis* and the other species of the genus.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
U.S.N.M.: 26317.....	F.	Adult...	Utilla Island, Honduras..	1898	Dr. J. E. Jarnigan.	Type.
25324.....	F.	do	do	1898	do	Paratype.

## CTENOSAURA PALEARIS Stejneger

Plates 22, 23

*Ctenosaura palearis* STEJNEGER, 1899, Proc. U. S. Nat. Mus., vol. 21, pp. 381-383; 1901, vol. 23, pp. 467-468.

*Type*.—Cat. No. 22703, U.S.N.M., male.

*Type locality*.—Gualan, Guatemala, 1899; Mrs. K. I. P. McElroy, collector.

*Diagnosis*.—A large dewlap hanging from posterior part of throat; caudal whorls of spines separated by a single row of flat scales; upper side of tibia covered with large hexagonal scales, each armed with a central spine; dorsal crest high, but composed of 35 to 45 spines only; interrupted in the sacral region.

*Distribution*.—This species inhabits the dry flat sandy zone of Guatemala in the vicinity of Gualan, at an elevation of from 1,000 to 2,000 feet. It has been taken at Gualan, and at Cuastotoya, Jalapa, Guatemala. These two points represent a very restricted area lying just south of the Motagua River.

*Description*.—The following description of the type specimen, an adult male, Cat. No. 22703, U.S.N.M., is from Doctor Stejneger's original paper.

Head rather short; muzzle with decurved profile, covered above with rather large and slightly rugose scales; supraoculars small, nearly granular externally, larger, hexagonal and flat internally, separated from each other by three rows of scales; parietal scales slightly smaller than those on top of muzzle, tubercular; nostrils large, much nearer the tip of snout than the orbit, almost tubular, opening obliquely backward; behind nostrils a large, flat scale; one or two canthal scales; lores flat; temporals slightly smaller than the occipitals, tubercular; 10 or 11 enlarged supralabials; 9 enlarged sublabials; ear opening as large as orbit; dorsal scales small, hardly more than half the size of the ventral scales, gradually increasing in size posteriorly, smooth; a well developed dorsal crest, barely indicated on the rump. The spines of the crest, 45 in number, all told, begin almost immediately behind the head; first six spines very small, followed by two somewhat larger ones; ninth is suddenly larger and tenth still larger, equaling the largest; the spines are very compressed, about 8.3 mm. (0.325 inch) high and 3.8 mm. (0.15 inch) wide at base, and falcate in shape; their base is flexible and covered for about one-fourth of their height with two to three rows of minute scales; the last 12 spines decrease gradually in size, the last being equal to the first ones on the nape; about 10 small carinated scales follow until the caudal crest begins; three transverse dermal folds across the throat which, with a similar one behind the ear, join two longitudinal folds on the side of the neck; these extend backward over the shoulder for some distance; between the anterior and posterior transverse gular folds a large compressed dewlap 32 mm. (1¼ inches) from middle of base to top, the base along the middle of the throat being about 38 mm. (1½ inches); scales on throat and dewlap slightly smaller than the ventral scales, all smooth; scales on upper side of arm carinate, those on lower arm slightly larger, more distinctly carinate and somewhat spinous at tip; scales on femur slightly larger than ventral scales, those on the upper surface obtusely keeled and with a small pointed tubercle at tip; scales on upper middle portion of tibia greatly enlarged, more or less regularly hexagonal, each with a falcate



spine near center; scales on upper side of hind feet toward toes enlarged, keeled, and spinous; 7 large femoral pores on each side; tail somewhat constricted at insertion, much depressed at base, becoming subcylindrical posteriorly; caudal scales above and laterally in whorls of large spinous scales, separated by a single row of smaller flat scales, the central one being spinous, however; in the spinous row the median scales are the shortest, the lateral one the longest, while in the smaller and smooth row the proportion is reversed, so that the anterior outline of the large row is concave and the posterior outline of the small row is convex; the outlines of each pair or rows perfectly straight; in the spinous row the scale on each side of the central one is without a spine; the lateral spines are straight; the central falcate, the median spines form a caudal crest, in the basal half of which the spines alternate large and small, according to whether they belong to the large or small row; caudal scales below much smaller, three rows corresponding to each pair above, strongly keeled and pointed posteriorly.

Adult female: Same as male except that the dewlap is smaller and the dorsal crest is made up of shorter spines.

*Measurements.*—

	U.S.N.M. No. 22703, adult, male
Length of head.....	40 mm.
Length of body.....	140 mm.
Length of tail.....	230 mm.
Total length.....	410 mm.
Width of head over orbits.....	23 mm.

*Coloration.*—Green with yellow variegations on throat, dewlap, and lateral folds; dorsal crest pale yellowish; on body several ill-defined, chevron-shaped blackish bands, which do not cross the dorsal crest, but the posterior three of which reach the abdomen; tail marked with broad bands of dull blackish brown.

*Remarks.*—Doctor Stejneger says:

Another specimen (No. 22704, U.S.N.M.) of the same age and sex, which differs in no essential feature from the one described, except that the dorsal crest contains 36 spines only, and that the interruption between the dorsal and caudal crests is complete, being not even indicated by a row of carinated scales. Another peculiarity is that one of the small scales at the base in front of each dorsal spine has developed into a very minute spine. A third specimen (No. 24459, U.S.N.M.) is very young, only 198 mm. (7.8 inches) long. The dewlap is already well indicated, being 5 mm. (0.2 inch) deep; all the other diagnostic characteristics are also present and well marked. The dorsal crest is quite pronounced, the spine being triangular, about as high as long; the large ones standing some distance apart, the interval being wider than the basis of the spines; the small ones as the anterior and posterior ends are placed quite close; the number of the spines is 37; the crest perfectly interrupted on the rump. Eight femoral pores. Color essentially as in adults.

The material from which the type was described was received at the United States National Museum in 1899 from Mrs. K. I. P. McElroy of Gualan, Guatemala.

In May, 1926, Doctor MacPhail, of the United Fruit Co. Hospital at Quirigua, forwarded to Dr. Thomas Barbour, at the Museum of Comparative Zoölogy, 12 very fine specimens. They also were taken

at Gualan, Guatemala, and agree with the type specimen in every essential characteristic and have been designated as topotypes. This is a remarkable series of a very rare species, nine males and three females.

Two specimens belonging to the California Academy of Science were examined and they also agree perfectly with the type. They were collected at Cuastatoya, Jalapa, Guatemala.

In Doctor Stejneger's original paper on this species he emphasized its close affinity to the other members of the genus, and stated that the presence of the dewlap was not sufficient ground upon which to erect a new genus. His discovery of *Ctenosaura bakeri* three years later, 1901, has bridged the gap between *palearis* and the other species of the genus and also demonstrated the wisdom of not creating a new genus based upon the dewlap character.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
U.S.N.M.: 22703	M.	Adult	Gualan, Guatemala.	1899	Mrs. K. I. P. McElroy.	Type.
22704	F.	do	do	1899	do	
24459	M.	do	do	1899	do	
48935	F.	do	Guatemala.		Prof. Newton Miller.	
C.A.S.: 857	M.	Young	Cuastatoya, Guatemala.	(?)	(?)	
1098	M.	Adult	Guatemala.	(?)	(?)	
M.C.Z.: 22392	F.	do	Gualan, Guatemala.	1926	Doctor MacPhail.	Topotype.
22394	F.	do	do	1926	do	Do.
22398	F.	do	do	1926	do	Do.
22393	M.	do	do	1926	do	Do.
22395	M.	do	do	1926	do	Do.
22396	M.	do	do	1926	do	Do.
22397	M.	do	do	1926	do	Do.
22399	M.	do	do	1926	do	Do.
No number.	3M.	do	do	1926	do	Do.

CTENOSAURA QUINQUECARINATA (Gray)

Plates 24, 25, 26

*Cyclura quinquecarinata* GRAY, 1842, Zool. Misc., p. 59.—SUMICHRAST, 1873, Arch. Sci. Phys. Nat., vol. 46, p. 259.

*Enyliosarus quinquecarinata* GRAY, 1845, Cat. Lizards Brit. Mus., p. 192.

*Cyclura (Ctenosaura) quinquecarinata* COPE, 1869, Proc. Amer. Philos. Soc., vol. 11, p. 161.

*Ctenosaura (Enyliosaurus) quinquecarinata* BOCOURT, 1874, Miss. Sci. Mex., vol. 3, Reptiles, p. 138; 1876, Journ. Zool., vol. 5, p. 401.

*Ctenosura quinquecarinata* SUMICHRAST, 1880, Bull. Soc. Zool., vol. 10, p. 175.—BOCOURT, 1882, Le Nat., vol. 2, No. 6, p. 47.—BOULENGER, 1885, Cat. Lizards Brit. Mus., vol. 2, p. 198.—COPE, 1886, Proc. Philos. Soc. Amer., vol. 23, pp. 266-269.—GÜNTHER, 1890, Biol. Centr. Amer., Rep. and Batr., p. 58.—DUGÈS, 1897, La Nature, ser. 2, vol. 2, No. 12, p. 523, pl. 34.—COPE, 1900, Rept. U. S. Nat. Mus. for 1898, p. 238.—STEJNEGER, 1899, Proc. U. S. Nat. Mus., p. 383.

*Type.*—Brit. Mus. Nat. Hist. No. 61, male. Collected March 5, 1841, no locality.

*Type locality*.—Restricted to Tehuantepec, Oaxaca, Mexico.

*Diagnosis*.—Median dorsal crest made up of low, thin, leaflike scales, extending from nape to sacrum. Upper surface of hind limbs covered with large spinous scales. Upper surface of tail covered with alternate rings of larger and smaller scales, the central, and especially the two or three lateral series of larger scales, being very large and heavily armed with a sharp spine directed backward. Except at base of tail the larger scales forming the three series on either side of the central caudal spines are flat.

*Distribution*.—The type specimen of *quinquecarinata* is a stuffed skin, in the British Museum of Natural History. It is without any locality or collector's label. Of the 23 specimens examined, 19 are designated as being from Tehuantepec, Oaxaca, Mexico; 2 are labeled merely "Mexico"; 1 is listed from Oaxaca, Mexico. In all probability all of the specimens came from Tehuantepec, at which place the elevation ranges from 100 to 600 feet above sea level. This species is perhaps confined to the Isthmus of Tehuantepec, and upon the evidence presented above I hereby restrict the type locality of *Ctenosaura quinquecarinata* to Tehuantepec, Oaxaca, Mexico.

*Description*.—Brit. Mus. Nat. Hist. Nos. 61, adult male, type, stuffed skin; 33, adult male, alcoholic specimen; U.S.N.M. Nos. 30127, female; 30561, male; 30562, male; 30563, male. Head normal in length, covered with small hexagonal scales, with slightly decurved muzzle. Supraoculars very small, being separated from each other by three rows of scales; nostrils large, on canthus rostralis, lateral; loreal region smooth. Supralabials, 8; sublabials, 10; rostral wider than mental; ear opening as large as orbit; strong transverse gular fold; dorsal scales small and smooth, being almost granular on neck and gradually increasing in size posteriorly until over small of the back. On the rump they become a little larger than ventrals, rhomboidal and obtusely keeled. Outer side of tibia armed with large spinous scales. Dorso-nuchal crest made up of 50 to 60 thin, leaflike scales ranging from 1 to 5 mm. in height, and extending from nape to small of back (loins), or to sacrum, but never continuous over sacrum; more pronounced in males than in females. Tail longer than head and body together, slightly constricted at insertion; depressed in its anterior third, but cylindrical posteriorly; its upper surface covered with alternate whorls of larger and smaller scales; the central, and especially the two (occasionally three) lateral series of the former, very large and spinous; the latter and the three (occasionally four) larger series adjacent to the central spinous row flat. First two or three whorls of large scales at base of tail are all spinous. Lower surface of tail covered with transverse series of smaller scales, strongly keeled and pointed posteriorly. Femoral pores vary from 5-5 to 7-7.

*Measurements.*—U.S.N.M., No. 30561,  
adult male

Length of head.....	35 mm.
Length of body.....	95 mm.
Length of tail.....	200 mm.
Total length.....	330 mm.
Width of head over orbits.....	20 mm.

*Coloration.*—Above and on sides pea green, mottled with black or brown; legs also pea green with prominent black splotches, in some instances taking the form of more or less indistinct transverse cross-bands; lower surfaces yellowish, uniform or spotted with brown; throat grayish, mottled; chin dark. The young are green throughout, being somewhat lighter on the under parts.

*Remarks.*—This species is very closely related to *clarki*, *erythromelas*, and *defensor*, and a comparison of it with these species is given under the remarks on *erythromelas*.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
Brit. Mus.: 2.....	F.	Adult...	Oaxaca, Mexico.....	Nov. 11, 1841	Purchased from Bocourt collec- tion.	
29.....	M.	do	do	Sept. 30, 1903	H. Gadow	5 specimens.
33.....	M.	do	Tehuantepec city, Oaxaca, Mexico.	Oct. 10, 1890	A. C. Butler	
61.....	M.	do	(?)	March, 1841	(?)	Type. Stuffed skin.
(?)		do	Oaxaca, Mexico.....	(?)	(?)	
Paris Mus.:						
1322.....	{M. & F.}	{do	{do	{(?)	F. Sumichrast	2 specimens.
5916.....	{M. & F.}	{do	{do	{(?)	do	
Hamburg Mus.:						
661.....	M.	do	"Mexico".....	1878	Fischer	Do.
662.....	F.	do	do	1878	do	
735.....	M.	do	(?)	1879	Schilling	
1208.....			Hugma, Terminos	1891	Peersen	
1717.....			"Mexico".....	1894	Nepperschmid.	
3200.....			(?)	1904	Poppinhausen	
U.S.N.M.:						
30127.....	F.	Adult...	Tehuantepec, Oaxaca.	(?)	F. Sumichrast	} A good series of the species.
30561.....	M.	do	do	(?)	do	
30562.....	M.	do	do	(?)	do	
30563.....	M.	do	do	(?)	do	
30564.....	M.	do	do	(?)	do	
30565.....	F.	do	do	(?)	do	
30566.....	M.	do	do	(?)	do	
30567.....	M.	do	do	(?)	do	

## CTENOSAURA CLARKI, new species

## Plate 27

*Type.*—M.C.Z. No. 22454, male, paratype. U.S.N.M. No. 21499, female.

*Type locality.*—Ovopeo, Michoacan, Mexico.

*Diagnosis.*—Dorsal crest indicated by 80 slightly raised scales. Tail shorter or equal to length of head and body, its upper surface with whorls of very large subequal spines, directed upward and

backward, alternating with series of smaller yet conspicuous basal flat scales.

*Distribution.*—Of the six specimens of this species known to be in museum collections, only one bears a locality label. This one specimen, M.C.Z. 22454, an adult male, was taken at Ovopeo, Michoacan, Mexico, at an elevation of 1,000 feet, January, 1908, by Dr. H. Gadow, and was received by the M.C.Z. from the British Museum of Natural History in 1926 in exchange. This being the only record for this species I hereby restrict the type locality of *Ctenosaura clarki* to Ovopeo, Michoacan, Mexico.

*Description.*—M.C.Z. No. 22454, adult male, type; U.S.N.M. No. 21499, adult female, paratype. Head normal in length, covered with medium-sized scales, which are slightly rugose and convex. Muzzle slightly decurved, loreal region slightly concave; supra oculars small, being separated from each other by three rows of scales; parietals smaller than those on top of muzzle; nostrils large, on canthus rostralis; supralabials 1; sublabials 1; rostral and mental of equal width; ear opening as large or almost as large as orbit; transverse gular fold prominent; dorsal scales small on nape, becoming larger posteriorly until about the mid-region of the back where they are larger than the ventrals, being rhomboidal in shape, obtusely keeled and slightly carinated, more so in the sacral region. Lateral scales smaller than either dorsals or ventrals. Upper surface of hind limbs with medium-sized spinous scales. Tail slightly shorter than head and body, slightly constricted at insertion, and somewhat depressed, except near distal end, where it is cylindrical; its upper surface with whorls of large subequal spines, directed upward and backward, alternating with series of smaller flat scales which are very conspicuous from the beginning; the two larger series of spinous scales adjacent to the central spinous row smaller than lateral series; lower surface of tail with smaller pointed keeled scales, the number of transverse series not being the same as on the upper surface except on the distal half of the organ. Dorsal crest made up of slightly raised scales beginning just back of head and continuing about two-thirds of the way down the back, gradually merging with the general dorsal scales. Digits shortened. Femoral pores 5-4.

*Measurements.*—

Length of head.....	M. C. Z. type, No. 22454, male 33 mm.
Length of body.....	110 mm.
Length of tail.....	132 mm.
Total length.....	275 mm.
Width of head over orbits.....	20 mm.

*Remarks.*—In the females the spinous scales of the tail do not show up as conspicuously as in the males, the two series adjacent to the

central spinous row often appearing as only slightly carinated scales. The conspicuousness of the intervening whorls of flat scales will readily separate it from its near relatives: *erythromelas*, and *defensor*; the short dorsal crest spines separate it from *quin quecarinata*.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
M.C.Z.: 22454	M.	Adult	Ovopeco, Michoacan, Mexico.	January, 1908	Dr. H. Gadow	Type.
U.S.N.M.: 21499	F.	do	"Mexico"	(?)	(?)	Paratype.
21450	M.	do	do	(?)	(?)	
21451	M.	do	do	(?)	(?)	
21452	M.	do	do	(?)	(?)	
21453	F.	do	do	(?)	(?)	

**CTENOSAURA ERYTHROMELAS Boulenger**

Plates 28, 29

*Ctenosaura erythromelas* BOULENGER, 1886, Proc. Zool. Soc. London, p. 241, pl. 23.—GÜNTHER, 1890, Biol. Cent. Amer., Rept. and Batr., p. 59.

*Cachryx erythromelas* COPE, 1887, Bull. 32, U. S. Nat. Mus., p. 43.

*Ctenosaura (Cachryx) annectens* WERNER, 1911, Jahrbuch Hamburg. Wissensch. Anst., Pt. 2, p. 25.

*Type.*—Brit. Mus. Nat. Hist. No. 1, male.

*Type locality.*—"Mexico." No exact locality known.

*Diagnosis.*—A slight indication of a dorso-nuchal crest. Scales on posterior part of back a little larger than ventrals, rhomboidal, indistinctly keeled. Upper surface of hind limbs with medium-sized spinous scales. Tail shorter than head and body, its upper surface with whorls of very large subequal spines, directed upward and backward, alternating with series of very small flat basal scales, the series of small flat scales hardly noticeable at first glance, but becoming more conspicuous posteriorly until near the mid-tail, where they are very conspicuous.

*Distribution.*—No exact locality is known for this species. The type was purchased alive in Liverpool, England. The dealer did not know whence it came. In 1905 Pohl sent several zoological specimens from "Mexico" to the Naturhistorischen Museums in Hamburg. Among the number was a specimen of this species, hence the type locality "Mexico."

*Description.*—Brit. Mus. Nat. Hist. No. 1, male, type. Head normal in length, covered with medium-sized scales, which in the adults are slightly rugose and convex. Muzzle only slightly decurved; loreal region slightly concave; supraoculars small, being separated from each other by three rows of scales; parietal scales smaller than those on top of muzzle; nostrils large, on canthus rostralis; supralabials, 8; sublabials, 9; rostral and mental of equal width; ear opening as large

or almost as large as orbit; transverse gular fold prominent; dorsal scales almost granular on nape, becoming larger posteriorly until about the mid-region of the back, where they are larger than the ventrals, being rhomboidal in shape, obtusely keeled, and slightly carinated, more so in the sacral region. Lateral scales smaller than either dorsals or ventrals. Upper surface of hind limbs with medium-sized spinous scales. Tail shorter than head and body, slightly constricted at insertion, and somewhat depressed, except near distal, where it is cylindrical; its upper surface with whorls of very large subequal spines, directed upward and backward, alternating with series of small, flat scales, inconspicuous at first glance, but becoming more conspicuous posteriorly until near the mid-tail, where they become very conspicuous; lower surface of tail with smaller, pointed, keeled scales, the number of transverse series not being the same as on the upper surface except on the distal half of the organ. Dorsal nuchal crest, beginning just back of the head on the nape, is indicated by 35 to 60 slightly raised median dorsal scales, which extend usually about one-third of the way down the back and then gradually merge with the general dorsal scales. In no instance does the dorsal crest extend completely to the sacrum. Digits shortened. With hind limb extended the longest digit reaches to the anterior insertion of the fore limb; femoral pores, 5-5, 6-6, to 8-8.

*Measurements.*—

	Hamburg, No. 3420, M.	Brit. Mus., type No. 1, M.
	<i>Mm.</i>	<i>Mm.</i>
Length of head.....	35	24
Length of body.....	120	66
Length of tail.....	150	88
Total length.....	285	178
Width of head over orbits.....	25	(?)

*Coloration.*—Boulenger in his original description figures this species in colors and gave the following description taken from a living specimen, the type.

Blackish olive above, with a large patch of vermilion-red on each side of the body, and variegations of the same color on the sides of the head and neck; lower surfaces grey; throat marbled with red; three oblique black bands on each side behind the fore limb; two black bands across the humerus. Tympanum yellowish. Iris golden.

Werner's type specimen of *Ctenosaura (Cachryx) annectens*, an adult male in the museum in Hamburg, Germany, although preserved in alcohol for several years<sup>29</sup> and without its epidermis, exhibits a distinct reddish tinge about the head, neck, and shoulders.

<sup>29</sup> Described in 1911, but probably in alcohol many years previous.

*Remarks.*—This species along with *clarki* bridges the gap between *quinquecarinata* and *defensor* and justifies the union of the two genera as suggested by Boulenger.<sup>30</sup> The chief differences between *quinquecarinata*, *clarki*, *erythromelas*, and *defensor* are to be found in the characters of the tail. In *clarki* and *erythromelas* the tail, like that of *defensor*, is shorter than the head and body, one character that sets the three species off from *quinquecarinata*, whose tail is longer than the head and body. The main distinguishing characters, however, have to do with the arrangement of the spinous scales on the tail. In *defensor* the entire upper surface of the tail is covered with whorls of strong erect conic spinous scales which are not separated by rows of smaller flat scales; in *erythromelas* the upper surface of the tail is covered with whorls of very long subequal spines, alternating with a series of small flat basal scales, hardly visible at first glance, but becoming more conspicuous posteriorly until near the middle of the tail, where they become very conspicuous; in *clarki* the whorls of spines alternate with whorls of smaller flat scales which are very conspicuous from the base of the tail to its tip, while in *quinquecarinata* the tail is covered with alternate whorls of large and smaller scales, the central, and especially the two (occasionally three) lateral series of the former, very large and spinous; the latter and the three (occasionally four) larger series adjacent to the central spinous row flat, except the first two or three whorls of large scales at the base, which are all spinous.

Werner described *Ctenosaura (Cachryx) annectens* from a specimen of *erythromelas*. Although the specimen is damaged, it agrees in every particular with the true *erythromelas*, to which it must be assigned. This specimen was collected in 1905 by Phol, but its locality, as I have said, is unknown.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
Brit. Mus. No. 1... Hamburg 3420....	M. M.	Adult..... ...do.....	(?)..... "Mexico".....	(?) 1905	Purchased alive... P. Phol.....	Described. Type <i>annectens</i> .

#### CTENOSAURA DEFENSOR (Cope)

##### Plate 30

*Cachryx defensor* COPE, 1866, Proc. Acad. Nat. Sci. Philadelphia, vol. 18, p. 124; 1869, Proc. Amer. Philos. Soc., p. 169, pl. 10.—BOCOURT, 1870, Miss. Sci. Mex., vol. 3, Reptiles, p. 148, pl. 17, fig. 12, 12a.—BOULENGER, 1885, Cat. Lizards Brit. Mus., vol. 2, p. 198.—COPE, 1887, Bull. 32, U. S. Nat. Mus., p. 34.—DUGÈS, 1897, Soc. Mex. Hist. Nat., ser. 2, vol. 2, No. 12, p. 524.—BERG, 1902, Zool. Garten, vol. 43, No. 3, p. 86–92.

*Ctenosaura defensor* GÜNTHER, 1890, Biol. Cent. Amer., Rep. Batr., p. 58.

<sup>30</sup> Boulenger, Proc. Zool. Soc. London, p. 241, 1886.



*Type*.—Three cotypes, U.S.N.M., male No. 12282, Yucatan. A. Schott, collector.

*Type locality*.—Restricted to Chichén Itzá, Yucatan, Mexico.

*Diagnosis*.—Tail short, almost flat, covered with whorls of strong, erect, conic spinous scales, which are not separated by rows of small flat scales. Scales on femur and tibia are spiniferous and larger than those of the fore limbs. Dorsal crest barely noticeable, being made up of slightly carinated scales, and extending from the nape to the beginning of the sacrum. Scales on the rump larger than those on body. Digits shortened.

*Distribution*.—This lizard is known only from Yucatan, Mexico. It is a ground-dwelling species and is most abundant on the desert and semiarid limestone plains of the peninsular, having been taken at Chichén Itzá.

*Description*.—M.C.Z. No. 7095, adult female. Head normal in length, covered with fairly large scales, having slightly decurved muzzle. Scales of head somewhat convex, those on muzzle being larger than others; supraoculars smaller than parietals, separated from each other by three rows of scales; nostril on canthus rostralis, lateral; loreal region concave. Supralabials 7; sublabials 7; ear opening as large as orbit, without marginal serrations. Scales of body small, slightly imbricate, homogeneous, smooth, in transverse series, and obliquely longitudinal, larger on rump, smaller on the sides; a slightly larger vertebral series forming a barely noticeable dorsal crest which extends from the nape to the beginning of the sacrum. Abdominals smooth and equal; gulars a little smaller, equal on plica. A prebranchial and postbranchial fold. Scales of fore limbs moderate, some of those on femur and tibia much larger, spiniferous. Tail short, flat, and covered with 15–25 whorls of strong, erect, conic, spinous scales, which are not separated by smaller flat scales. The scales below are margined and keeled, the carina being prolonged into a flat spine. Spiniferous superior whorls made up of seven longitudinal series; the spines being erect, those of the median row smaller. With hind limbs extended the longest digit does not reach the axilla. Femoral pores 6–6 to 11–11.

*Measurements*.—

M.C.Z. No. 7095,  
adult, male

Length of head.....	32 mm.
Length of body.....	90 mm.
Length of tail.....	100 mm.
Total length.....	222 mm.
Width of head over orbits.....	17 mm.

*Coloration*.—General color, bright olivaceous. Shoulders and interscapular region almost black; the latter with two cross series of green spots, more or less distinct on the whole body in young specimens.

In older specimens the median dorsal region is bright rufous. Underparts light.

*Remarks.*—This species is decidedly iguaniform, but the digits are too short for an arboreal habit. A comparison of this species with its nearest relatives, *erythromelas*, *clarki*, and *quinquecarinata*, is given under the discussion of the former.

*Material examined.*—

Specimen	Sex	Age	Locality	Date	Collector	Remarks
M. C. Z. No. 7095.	F.	Adult.....	Chichén Itzá, Yucatan, Mexico.	(?).....	L. J. Cole.	Described.
Brit. Mus. No. 1.	-----	-----do-----	(?).....	Sept. 21, 1900.	(?).....	
U. S. N. M. 12282.	M.	Adult and half grown.	Yucatan, Mexico.....	-----	A. Schott.	3 cotypes.

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## EXPLANATION OF PLATES

### PLATE 1

*Ctenosaura acanthura* (Shaw). Head and body of half-grown female, Brit. Mus. Nat. Hist. No. XXII 20a-type

### PLATE 2

*Ctenosaura acanthura* (Shaw). Sacral region and tail of half-grown female, Brit. Mus. No. XXII 20a-type

### PLATE 3

*Ctenosaura acanthura* (Shaw). Cotype of *C. cycluroides* Wiegmann, Zoologisches Museum, Berlin No. 577 which is now M.C.Z. No. 22453, a half-grown male

### PLATE 4

*Ctenosaura acanthura* (Shaw). Adult male M.C.Z. No. 16074

### PLATE 5

*Ctenosaura hemilopha* (Cope). Adult male M.C.Z. No. 13179

### PLATE 6

*Ctenosaura brachylopha* (Cope). Adult female stuffed skin. Cotype U.S.N.M. No. 7180

### PLATE 7

*Ctenosaura pectinata* (Wiegmann). Type of *Cyclura* (*Ctenosaura*) *pectinata*, Zoologisches Museum, Berlin No. 574, adult male, head and body

### PLATE 8

*Ctenosaura pectinata* (Wiegmann). Type of *Cyclura* (*Ctenosaura*) *pectinata*, Zoologisches Museum, Berlin No. 574, adult male, sacral region and tail

### PLATE 9

*Ctenosaura pectinata* (Wiegmann). Adult male M.C.Z. No. 2726

### PLATE 10

*Ctenosaura pectinata* (Wiegmann). Adult female, Amer. Mus. Nat. Hist., No. 119

### PLATE 11

Upper. *Ctenosaura pectinata* (Wiegmann), showing small size of femoral pores of female as compared to those of the male below.  $\frac{2}{3}$  natural size. M.C.Z. Lot No. 2726

Lower. *Ctenosaura pectinata* (Wiegmann), showing the size of the femoral pores of the adult male.  $\frac{2}{3}$  natural size. M.C.Z. Lot No. 2726

## PLATE 12

*Ctenosaura brevirostris* Cope. Head, body, and sacral region of adult male.  
U.S.N.M. No. 47933

## PLATE 13

*Ctenosaura brevirostris* Cope. Half-grown male. Cotype, U.S.N.M. No. 24709

## PLATE 14

*Ctenosaura parkeri* Bailey. Adult female. Type, U.S.N.M. No. 18967

## PLATE 15

Heads of *Ctenosaura parkeri* Bailey (left), U.S.N.M. No. 18967, and *C. brevirostris* Cope (right), U.S.N.M. No. 47933. Compare the length of the heads. Both are adults

## PLATE 16

*Ctenosaura similis* (Gray). Cotype of *Ctenosaura completa* Bocourt, Muséum d'Histoire Naturelle de Paris, No. 2252. Adult male

## PLATE 17

*Ctenosaura similis* (Gray). Half-grown male, M.C.Z. No. 21102, and young male, M.C.Z. No. 22669. Note the stripes on both

## PLATE 18

*Ctenosaura similis* (Gray). Adult female taken in March, 1927. Oviducts filled with mature eggs. M.C.Z. No. 22624

## PLATE 19

*Ctenosaura similis* (Gray). Adult male, M.C.Z. No. 22625

## PLATE 20

Upper. Typical habitat of *Ctenosaura similis* (Gray). Punta, Paitilla, near Panama City, Panama

Lower. Typical habitat of *Ctenosaura similis* (Gray). Punta, Paitilla, near Panama City, Panama

## PLATE 21

*Ctenosaura bakeri* Stejneger. Adult female. Paratype, U.S.N.M. No. 25324

## PLATE 22

Showing the dewlap of *Ctenosaura*: (a) *bakeri*, female, paratype, U.S.N.M. No. 25324; (b) *palearis*, male, topotype, M.C.Z. No. 22395; (c) *palearis*, female, topotype, M.C.Z. No. 22392

## PLATE 23

*Ctenosaura palearis* Stejneger (left), female, M.C.Z. No. 22392; (right) male, M.C.Z. No. 22395. Adults. Topotypes

## PLATE 24

*Ctenosaura quinquecarinata* (Gray). Sacral region and tail of type, Brit. Mus. Nat. Hist. No. 61. Dried skin, adult male

PLATE 25

*Ctenosaura quinquecarinata* (Gray). Sacral region and tail of alcoholic specimen,  
Brit. Mus. Nat. Hist. No. 33, adult male

PLATE 26

*Ctenosaura quinquecarinata* (Gray). U.S.N.M. No. 30561. Adult male

PLATE 27

*Ctenosaura clarki* Bailey. Type, M.C.Z. No. 22454. Adult male

PLATE 28

*Ctenosaura erythromelas* Boulenger. Type, Brit. Mus. Nat. Hist. No. 1. Adult  
male

PLATE 29

*Ctenosaura erythromelas* Boulenger. Sacral region and tail of the type. Brit.  
Mus. Nat. Hist. No. 1. Adult male

PLATE 30

*Ctenosaura defensor* (Cope). Adult male, M.C.Z. No. 7095